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Strategic Management in the Telecom Industry to Create Competitive Advantage

Dissertação apresentada à Universidade de Aveiro para cumprimento dos requisitos necessários à obtenção do grau de Doutor em Gestão Industrial, realizada sob a orientação científica da Professora Doutora Maria Elisabeth Teixeira Pereira e Rocha, Professor Auxiliar do Departamento de Economia, Gestão e Engenharia Industrial da Universidade de Aveiro, e do Professor Doutor António Luís de Jesus Teixeira, Professor Associado do Departamento de Eletrónica, Telecomunicações e Informática da Universidade de Aveiro

To my father and late mother.

To my wife, daughter, and son.

o júri

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The Ph.D. program is considered by most a long journey of research. For me, the journey was much longer as it started when I entered the telecom industry 16 years ago. The drastic changes in the telecom industry over those years have made it a good area for research especially when telecom operators are at a crossroad with no clear path to follow.

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palavras-chave

Gestão Estratégica, Blue Ocean Strategy, Indústria de Telecomunicações, Operadores de Telecomunicações, Modelo de Negócio.

Resumo

O presente trabalho teve por objetivos a identificação de uma estratégia e o desenvolvimento de um modelo que permita às operadoras de telecomunicações a sua sustentabilidade, bem como a identificação de caminhos para a adaptação a uma realidade sempre em mudança como é a da indústria das telecomunicações. Numa primeira parte do trabalho elaborou-se uma revisão de literatura do atual estado da arte das principais estratégias relevantes e com aplicação à indústria de telecomunicações. A pesquisa realizada investigou a estrutura atual da indústria de telecomunicações e o estado da competitividade das operadoras de telecomunicações. Dos resultados desta foi possível constatar uma evolução constante da tecnologia e dos modelos de negócio neste ecossistema, assim como a presença de uma pressão concorrencial significativa exercida sobre as operadoras, quer por parte das empresas já existentes no mercado quer por parte das emergentes. As operadoras têm de transformar o seu modelo de rede e de negócios para se adaptarem às mudanças e às tendências da indústria e do mercado.

Com base na revisão de literatura, elegeu-se a metodologia baseada num inquérito de pesquisa empírica para aferir o estado da indústria e derivar as estratégias possíveis. Este inquérito foi efetuado a especialistas da área de telecomunicações de diferentes subsectores e países para abordar todos os elementos estratégicos do modelo de negócio futuro. Os resultados da pesquisa revelaram que as empresas que operam no mercado da Internet (Over The Top - OTT) representam a maior ameaça sobre o futuro dos operadores de telecomunicações. Os operadores só vão conseguir responder através da modernização de sua rede, melhorando a qualidade, reduzindo o custo global, e investindo em produtos inovadores e diferenciados e em serviços. Os resultados do inquérito revelam-se de acordo com os pressupostos da Blue Ocean Strategy. A aplicabilidade da Blue Ocean Strategy foi aprofundada permitindo concluir que o valor inovador obtido simultaneamente através da redução de custos e da diferenciação permitem aumentar as vantagens dos operadores existentes em termos das infra-estruturas físicas detidas e das relações estabelecidas com os clientes. O caso particular da fibra óptica até casa (FTTH) foi considerado como aplicação da Blue Ocean Strategy a uma nova tecnologia que as operadoras podem implementar para criar novas soluções e abrir segmentos de mercado inexplorados. Os resultados do inquérito e da investigação realizada à aplicação da Blue Ocean Strategy foram combinados para propor um novo modelo de negócio para as operadoras de telecomunicações que lhes permite, não só responder aos desafios existentes, mas, também, ter uma melhor posição competitiva no futuro. Foi, ainda, realizado um estudo de caso que destacou como a Verizon Communications foi capaz de transformar a sua rede e o modelo de negócio em resposta ao aumento da pressão competitiva. Através do valor da inovação transferida aos seus clientes, a Verizon foi capaz de aumentar significativamente as suas receitas e satisfação do cliente.

key words Strategic Management, Blue Ocean Strategy, Telecom Industry, Telecom Operators, Business Model.

abstract

The present research work aims at identifying a strategy and model that telecom operators can follow not only to survive but also to strive in the ever-changing technology-intensive telecom industry.The first effort was to review the current state of the art in terms of the relevant strategy work that can be applied to the telecom industry. The research investigated the existing structure of the telecom industry and the competitiveness of telecom operators. This investigation has revealed that operators are under significant competitive pressure from old and new competitors. Meanwhile, the technology and the telecom industry continue to evolve. Operators have to transform their network and business model to adapt to changes and trends in the industry. A research survey was conducted with experts representing different demographics to address the main strategic elements in the future business model. The research revealed that Internet companies (Over The Top - OTT) pose the highest threat on the future of operators. This is mainly due to their low cost structure, fast innovation, and fast growth. This growth is congesting the operators' network while eroding their revenues. Operators can only respond by modernizing their network, improving quality, reducing the overall cost, and investing in innovative and differentiated products and services. The research work found that the survey outcome was in line with elements in the blue ocean strategy. The applicability of the blue ocean strategy was investigated further and it was found that innovating value through simultaneous reduced cost and product differentiation would leverage the operators' existing advantage in terms of owning the physical infrastructure and having established relationship with customers. Fiber to the home was researched to highlight how blue ocean strategy can be applied on a new technology that operators can deploy to generate new demand and create uncontested market space. The research findings from the survey and the investigation of applying blue ocean strategy were combined to propose a new business model for telecom operators to enable them to not only respond to existing challenges but also to have the best competitive position for the future. A case study highlighted how Verizon Communications was able to transform their network and business in response to the increased competitive pressure. By innovating value to customers, Verizon was able to significantly increase the revenues and customer satisfaction.

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List of acronyms and abbreviations

Abbreviation	**Description**
ARPU	Average Revenue Per User
AT&T	American Telephone & Telegraph
BOS	Blue Ocean Strategy
CAGR	Compounded Annual Growth Rate
CATV	Community Antenna Television
CAPEX	Capital Expenditure
CDN	Content Delivery Network
CLEC	Competitive Local Exchange Carriers
CO	Central Office
CRM	Customer Relationship Management
DOCSIS	Data over Coax Service Interface Specifications
DSL	Digital Subscriber Loop
DSLAM	Digital Subscriber Loop Access Multiplexer
DVR	Digital Video Recorder
FiOS	Fiber Optical System
FMC	Fixed Mobile Convergence
FTTC	Fiber to the Curb
FTTH	Fiber to the Home
FTTN	Fiber to the Node
HD	High Definition

HSI	High Speed Internet
HFC	Hybrid Fiber Coax
IaaS	Infrastructure as a Service
IEEE	Institute for Electrical and Electronics Engineer
ILEC	Incumbent Local Exchange Carriers
IP	Intellectual Property
IP	Internet Protocol
IPTV	Internet Protocol Television
ITU	International Telecommunications Union
KPI	Key Performance Indicator
KSF	Key Success Factors
LLU	Local Loop Unbundling
MBB	Mobile Broadband
MDU	Multi Dwelling Unit
MSO	Multi System Operator
MTU	Multi Tenant Unit
MVNO	Mobile Virtual Network Operator
NMS	Network Management System
OSP	Outside Planet
OPEX	Operational Expenditure
OTT	Over The Top
PaaS	Platform as a Service
P2P	Peer to Peer
PON	Passive Optical Network
PPU	Pay Per Usage
PPV	Pay Per View

PVR	Personal Video Recorder
QoE	Quality of Experience
QoS	Quality of Service
RBV	Resource-Based View
RT	Remote Terminal
SaaS	Software as a Service
S-C-P	Structure-Conduct-Performance
SFU	Single Family Unit
SLA	Service Level Agreement
SMB	Small and Medium Business
STB	Set Top Box
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TDM	Time Division Multiplexing
TDMA	Time Division Multiple Access
VDMS	Verizon Digital Media Services
VoD	Video on Demand
VoIP	Voice over IP
WDM	Wavelength Division Multiplexing
WWW	World Wide Web
Y/Y	Year over Year

Chapter 1

Introduction

1.1 Context

Advances in information technologies (IT) and telecommunications in the last two decades facilitated the process of globalization (Friedman, 2005). This ended up impacting every industry including the telecommunication industry itself. The gap between the different world-economies started to shrink as countries started investing more in the high tech industry to stimulate what came to be known as the digital or the new economy as elaborated by Zakaria (2009).

After the dot.com bubble burst, telecom companies had to be cost-conscious in their operation and had to make sure that the fundementals are solid behind every investment decision. Non-core businesses were getting divested, outsourcing activities took off vigorously, and we started witnessing a massive consolidation in the industry.

As countries started realizing the importance of upgrading their Telecom infrastructure for their national competitive advantage, they decided to open the door for competition, for both domestic and foreign companies. Fixed and Mobile licenses were no longer monopolies to state-owned companies, but were offered in auctions in the open market. Strong regulatory authorities were formed to enforce competition in the marketplace. This created huge opportunities to international telecom operators (a.k.a. telcos) wishing to expand in foreign markets, especially with the unbundling regulations that enabled new entrants to have immediate access to the incumbent’s network.

Foreign markets traditionally were not attractive to incumbent telecom companies who were spoiled by the size and wealth of their home market and ignorant of foreign cultures and market requirements. As local markets got saturated and became more competitive, companies started looking more seriously at opportunities internationally (Lal and Strachan, 2007). Local markets have converged into one global market, and that created an increased pressure on incumbents to find new and innovative strategy to position themselves against existing and new competitors.

Another significant factor that has been impacting telcos is the strong emergence and proliferation of the Internet. The Internet has been experiencing a phenomenal growth since its introduction into the public domain. Many over-the-top (OTT) players have emerged with innovative services and applications that stimulated the Internet traffic growth. Owning the physical telecom infrastructure is no longer a competitive advantage for telcos since it has been neutralized by all the unbundling requirements. But yet, telcos have to continue to invest upgrading in their telecom infrastructure to be able to cater to the growth in the bandwidth demand.

If we combine all these factors and add to them the international efforts to standardize everything in the telecommunication network, we realize that the competitive landscape in the telecom industry has changed dramatically. The pressure became huge on telecom executives in managing technology and innovation within their companies especially after the global financial crisis that hit the world end of 2008 and early 2009. They have to continue to monitor the evolution in the industry and make the right adjustments so their companies can survive and prosper in the future.

One lesson learned from the telecom’s downturn that followed the dot.com bubble burst is that telecom companies should be carefull with their strategy in terms of where to invest and how to invest. The telecom industry is cyclical by nature, and blindly following the hype, that can be associated with technologies, can lead to a complete destruction of the company when things turn bad. Conglomerates, such as Marconi, have vanished for having the wrong strategy of depleting their cash in overpriced acquisitions and in financing their customers (Kam, 2006). Companies that are managed well are in a better position not only to survive downturns but to actually expand their market share. This could happen by filling the vacuum left by their competition, acquiring other businesses at a discount, and continuing to invest in new products and technologies when the competitors are restructuring to survive (Rigby, 2001). This enables companies to build enough momentum for strong upward growth mobility even before the downturn is over.

The key to strategically manage a telecom company is to understand the dynamics of the telecom industry. Regulatory authorities play a significant rule in influencing the strategy of companies in different international markets. If we take the broadband deployment as an example, we find a big gap between Europe, North America, and Asia. Barriers to entry have become small to almost non-existent. Suppliers and buyers can become direct competitors and there is a continuous flow of startups who introduce major threats with disruptive technologies. In order for companies to stay competitive, they have to engage in partnerships, joint ventures, and alliances with customers, suppliers, and even direct competitors. This could result in win-win situations, but could also pose a major threat to the company's long-term profitability and competitiveness.

Maintaining a healthy cash reserve while continuing to invest in new technologies and expanding market share can be a very difficult proposition. During tough economic times, placing certain assets and projects outside the company's walls can actually preserve opportunities for future growth while the company takes the time to solidify the business internally. Relying on what came to be known as open innovation can reduce the costs of R&D and the risks associated with that investment but without sacrificing future growth (Chesbrough and Garman, 2009). Relying on open innovation might be the best solution to the dilemma of balancing technological leadership and financial health.

There are many other lessons learned from the Telecom industry the last 10 years, but the most important one is adaptability (Eunni et al, 2005). The company has to be prepared to quickly adapt to many unknowns. Most companies are unable to adapt to major changes, while others benefit from these changes if they are well positioned with the demands on the new environment (Cusumano, 2009).

Changes happen on a daily basis, both in macroeconomics and microeconomics. From the incredible boom of the economy in the late 1990s to the real estate boom which ended up in the recent financial credit crisis. Throughout the process, innovations in telecommunications have never stopped. Inflation rate has increased significantly in recent years, but customers continue to enjoy more advanced bundled telecommunication services at lower prices. At the end, someone has to pay for it. The telecom industry has become too crowded at every level of the value chain which has eroded profitability across the industry. The telecom industry, however, still has a lot of room for companies to grow. Growth can be by gaining market share, targeting fast-growing markets, or acquiring new businesses (Baghai et al, 2009). All three options are available for telecom companies as long as they craft the right strategy and continue to refine their strategy. Gains can be huge and mistakes can be catastrophic.

1.2 Motivation

Traditional models have described how companies can build a sustainable competitive advantage that competitors cannot overcome. These models were real breakthroughs in industrial strategic management. However, do these models in their current format still fit every industry and can determine profitability of an average competitor? Are all the recent changes in how companies do business included in these models? Can we merely rely on these models to formulate the right strategy for a dynamic and technology-intensive industry like the telecom industry?

At the same time, when we look at recent changes in technology and in the regulatory landscape, there are other questions that need answers. Are telecom companies better off sticking to their traditional business model or do they need to reinvent it? How can telcos cope with the increased competition, declined revenues, and eroded profitability? How can telcos turn the threat of increased Internet bandwidth demand into an opportunity? How should telcos face the traditional and the new/unconventional competitors?

When we examine the massive changes that the Telecom industry had to go through over the last 10 years, we find that the traditional strategy models do indeed need to be revised. This is mainly due to the eroded profitability of telcos, the shift in technology, and the emergence of new competitors. At the same time, different tools need to be utilized in formulating a suitable strategy.

The research work will drive to answer the listed questions in an effort to find the right strategy for telcos to gain a sustainable competitive advantage in the hypercompetitive telecommunication industry.

1.3 Thesis Objectives

The objective of the research work is to analyze the competing forces that are impacting the telcos, and investigate the right strategy to respond to them, so competitive advantage can be sustained.

The telecom industry structure needs to be analyzed with value chain and the existing competitive status for telcos needs to be investigated. These operators have witnessed major changes in technology and in their industry, and most operators have not adapted to these changes.

Another objective is to look at some of the technological changes in the telecom industry over the last decade. Services are converging and so is the telecom infrastructure. Services need to be carried in Internet Protocol (IP) packets over a Multi-Protocol Label Switching (MPLS) network. Voice needs to be carried in Voice over IP (VoIP) format, and television signals tend to be sent in IP Television (IPTV) streams, and both services are transported with the Internet data traffic. The mobile traffic can be combined in the same network in what is known as Fixed Mobile Converged (FMC) networks. Signals can be transported reliably on one network utilizing Wavelength Division Multiplexing (WDM) where each signal can be transported using a different wavelength or “color”.

Upgrading the network requires massive investment, but the investment is necessary in order for the operator to stay competitive and compensate for lost revenues from legacy services. Voice revenues, for example, were historically the cash generating engine for telecom companies in contributing to the majority of the revenues, but have dropped significantly in recent years. Price per bit is dropping as well, so telcos need to find new ways to stimulate data traffic and profit from that traffic. It doesn’t help when OTT companies were the ones profiting from the traffic growth while telcom operators are the ones making the investment. Telcos need to transform from being hardware and network providers and become solution providers instead. Responding to the evolving threat of OTT companies will be the major challenge for telcos. Analyzing the right strategy in responding to trends in technology will be key objective in this research work.

Applying the teachings of the Blue Ocean Strategy (Kim and Mauborgne, 2005), will be essentials for telecom companies to avoid mutually destructive battles in the over-crowded telecom market. At the same time, as the telecom market continues to receive new entrants, the telecom incumbent needs to be prepared for the new competitors who might have a different approach in attacking the market.

Finally, can companies keep a balance between having an efficient and lean operation and at the same time stay innovative and maintain their technological leadership? To achieve this challenging objective, telcos need to find ways to bring their operating cost down while they pursue to find new revenue opportunities through innovative products and services.

1.4 Thesis Outline

This thesis is organized in six chapters which cover the following topics:

Chapter 2 presents an overview of the literature to cover the concepts that will be discussed throughout the thesis. The literature review provides an overview for strategy and strategic management, market structure and Porter’s work on forces of competition and competitive advantage. The chapter also reviews value chain, value network, and business model due to their criticality in the telecom industry. Furthermore, the concepts of blue ocean strategy, open innovations, and critical success factors are presented. Understanding these concept can help explain the current status of the telecom industry and identify the best competitive strategy for the telcos to follow.

Chapter 3 focuses on characterizing the past, present, and future of the telecom industry. The chapter provides a historical background on how the telecom industry was formed, and a high level technical overview for a telco’s network is provided. The forces of competition in the telecom industry are presented with all the competitive pressure that they put on operators, and the value chain for telcos is presented. The existing competitiveness of telcos is discussed in the chapter which defines the question that this thesis is trying to address: how can telcos monitize their investment and transform their business to competitively face present and future challenges? One of the key elements in answering that question is to understand the trends in the industry. Trends in the telecom industry are reported in this chapter as well.

Chapter 4, based on the industry status and emerging trends reviewed in chapter 3, is focused on researching how telcos should respond to this challenge in an effort to answer the research question stated in chapter 3. In order for us to do that, a survey was designed and conducted with large number of experts in different positions within their companies, in different companies within the telecom value chain, and they cover the different regions of the world. The framework and methodology of the survey are presented and the findings are statistically analyzed, using correlation and cross-tabulation, and discussed in details.

Chapter 5 takes the findings from the research done in chapter 4 as an input and identifies based on the existing literature all the elements in a proposed strategy for telcos and the critical components that should be part of the future business model for telcos. The proposed strategy is based on some of the concepts in blue coean strategy and open innovation. A benchmark with Apple Inc. is discussed to determine some of the factors behind the success of Apple and how they can be applied to the telco's business model. Finally, a case study is presented focusing on Verizon Communications as an example of one of the telcos that appear to be on the right track in transforming their network and business in response to the disruptive changes in technology and the telecom industry.

Chapter 6 delivers a summary of the work and the main conclusions. Proposals for future work are also presented.

1.5 Main contributions

The most important results presented in this thesis are:

- Study of the telecom industry structure, value chain, and the existing status of competitiveness for telcos and analysis of the challenges that they face to stay competitive.

- Identification of the major forces of competition that are impacting telcos in terms of revenue potential and profitability and their potential threat on the future of telcos.

- Investigation of the trends in the telecom industry and their potential and value in terms of opportunities and threats to the future of telcos.

- Formulation of a research framework in a survey that covers all the critical elements that directly impact the current and future competitiveness of telcos based on the status of the industry, the emerging trends in technology and the industry, and the internal and external factors that impact the competitive position of the operators.

- Conducting a research survey with 122 carefully selected experts in the telecom industry who cover different layers in the corporate structure, and different areas in the telecom value chain, and also different regions of the world.

- Exploitation of the research data through descriptive statistical analysis to not only identify the outcome of each research question but also to cross-tabulate and correlate the answers and identify any demographic biases and relationships between answers with more focus on the threat of OTT companies and the telcos' need for a new business model.

- Investigation of the value of applying blue ocean strategy to the business model of telcos based on the status of the industry and the outcome of the research survey.

- Investigation of the key elements behind the success of Apple and the applicability of these elements to telcos. The investigation can serve as a benchmark for a company that has successfully transformed its business in line with the teachings of the blue ocean strategy. It can also serve to illustrate how a new competition to telcos is strongly emerging.

- Proposal of a business model based on the findings of the research survey and the inclusion of elements from the blue ocean strategy that were deemed most valuable to the future of telcos.

- Researching Verizon Communications in a case study and investigating the transformation in their network and business and the outcome of their strategy and business model and how it compares to findings in the research survey and the proposed business model.

The result of the research work was a total of three international conference papers, two journal papers, and a co-authored book chapter. Appendix I lists the contributions resultant from this work.

Chapter 2

Strategic Management and Competitive Advantage

2.1 Introduction

This chapter reviews the concepts that will be discussed throughout the thesis. The review will be critical to understand the foundation for the work set forth. Some of the concepts might not take into account the uniqueness of the telecom industry, but other concepts can be applied and were found to be very valuable to telcos.

The chapter will focus on strategic management with more attention to some of Porter's work on strategy and competitive advantage, Kim's and Mauborgne's work on blue ocean strategy, and Chesbrough's work on open innovation.

2.2 Strategy and Strategic Management

Strategy is believed to have a military origin, possibly dating back to about 500 BC (Sun Tzu, 1988). It has later found its way to the industrial world as companies were getting into fierce competition and were trying to identify their optimal position. The relationship between the structure of an organization and its strategy was defined as the determination of the basic long-term goals and objectives of an enterprise, and the adoption of courses of action and allocation of resources for carrying out these goals

(Chandler, 1962). Kenneth Andrews, in his book “The Concept of Corporate Strategy”, defined strategy as the match between what a company can do (based on the organizational strengths and weaknesses) within the universe of what it might do (in the presence of the environmental opportunities and threats) (Andrews, 1980).

More insights into each side of the strategy equation of Andrews (1980) were provided by Michael Porter. He defined strategy as the creation of a unique and valuable position, involving a different set of activities (Porter, 1980). If there were only one ideal position, there would be no need for strategy. Companies would face a simple task, be first to discover that position. If the same set of activities were best to produce all varieties, meet all needs, and access all customers, operational effectiveness would determine performance. The essence of strategic positioning is to choose activities that are different from rivals (Porter, 1980).

The founder of Boston Consulting Group, Bruce Henderson, stated later that: *“Strategy is a deliberate search for a plan of action that will develop a business’s competitive advantage and compound it. For any company, the search is an iterative process that begins with recognition of where you are now and what you have now. Your most dangerous competitors are those that are most like you. The difference between you and your competitors are the basis of your advantage. If you are in business and are self-supporting, you already have some kind of advantage, no matter how small or subtle. The objective is to enlarge the scope of your advantage, which can only happen at someone else’s expense”* (Henderson, 1989: p. 141).

Strategic management is a process for developing and enacting plans to reach a long-term goal that takes into account internal variables and external factors (Scribner, 2000). The concept has evolved over the years and was defined and characterized differently, but according to Nag et al (2007: p. 944), the general definition is: “*The field of strategic management deals with the major intended and emergent initiatives taken by general managers, on behalf of owners involving utilization of resources, to enhance the performance of firms in their external environments*”.

Strategic management is expected to be outwardly focused to take into account all the external factors that affect the future of a firm. It should also be forward-looking and performance-based since it would impact the future of the firm (Kiggundu, 1996). A firm is considered as having a production function that transforms inputs into outputs with the goal to maximize profit (Pepall *et al*, 2008). The firm has to choose a strategic position that enables it to maximize profit while considering tradeoffs with other positions. Tradeoffs occur when activities are incompatible and they also arise from limits on internal coordination and control (Porter, 2008).

Strategic technology management focuses on the technology aspect in the field of strategic management. The main themes identified within the strategic technology management are (Pilkington and Teichert, 2006):

1. Strategy and technology
2. National technology management systems
3. Sources of competitive strategy
4. Manufacturing, operations, and new product development
5. Knowledge management
6. Inventions and patent management
7. Lifecycles and discontinuities.

2.3 Market and Competition Structure

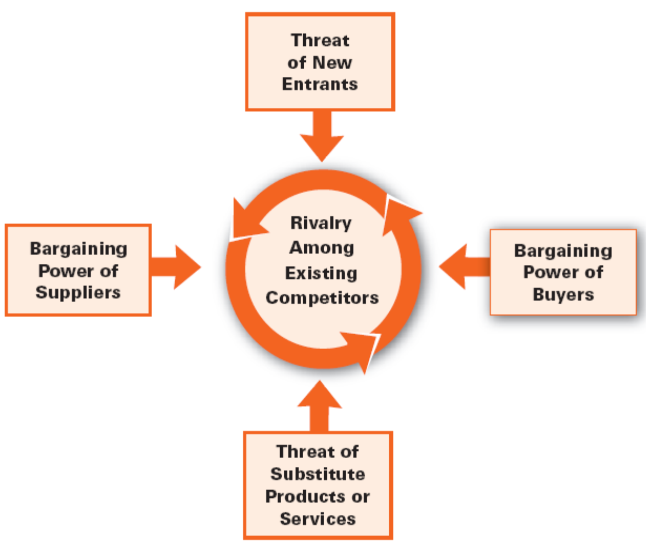
Market structure describes the state of a market with respect to competition. In a traditional framework, market structures can be identified as: perfect competition, monopolistic competition, oligopoly, duopoly, or monopoly (Baye, 1996). The perfect competition indicates that the market has large number of firms producing a homogeneous product. Originally the price exceeds the marginal cost which results in a profit and will invite new entrants to the market. In the long run, the price approaches the marginal cost resulting in a zero economic profit and making the market unattractive.

One key framework to analyze the competition structure in a competitive market is the structure-conduct-performance (S-C-P) framework. The S-C-P framework assumes that the structure of the industry influences the conduct of companies within that industry which determines industry performance (Bain, 1951). Porter (1980) viewed the S-C-P paradigm as giving managers a systematic model for assessing competition and for developing profit-maximizing strategies. The paradigm basically has two predictions: (1) concentration will facilitate collusion, and (2) as entry barriers rise, the optimal price-cost margin of the leading firms increases (Weiss, 1979).

The nature of competition and the overall industry structure are defined by what came to be known as Porter's five forces of competition (Porter, 1985). Understanding the industry structure and the forces in it is crucial to projecting possible areas where a company can gain competitive advantage in that industry. The company's market position in general determines the potential for profitability and growth, while its relative competitive advantage is what determines actual profitability and growth (Hamel, 1993).

2.4 Industry Competitive Forces

The operation of this breakthrough in strategy came in Michael Porter's book Competitive Advantage: Techniques for Analyzing Industries and Competitors (Porter, 1980). Porter's work was built on the structure-conduct-performance paradigm of industrial-organization economies.



Source: Porter, 2008: p. 80

Figure 2.1 Porter's Forces of Competition

The essence of the model is that the structure of an industry determines the state of competition within that industry and sets the context of companies' conduct – that is, their strategy. Most important, structure forces (which Porter called the five forces) determine the average profitability of the industry and have a correspondingly strong impact on the profitability of individual corporate strategies. An illustration of Porter's five forces is shown in figure 2.1.

The analysis of the industry environment includes bargaining power of buyers, bargaining power of suppliers, threat of entry, threat of substitutes, and the rivalry among existing competitors. According to Porter's framework, companies achieve competitive advantage by recognizing the industry structure, positioning themselves in relation to that structure, and shaping industry structure in a beneficial manner (Porter, 2008).

Threat of Substitutes

The extent to which a consumer is willing to pay for a product is dependent upon the availability of substitute products (Porter, 2008). When consumers have a choice of relatively similar products or can find close substitutes they will be sensitive to price increases for that product. For example, revenues from conventional long distance telephone service have been declining due to the advancement of low-cost internet based phone services such as Vonage and Skype.

Threat of Entry

The higher the return on capital in an industry, the more likely that industry will attract competitors for a share of those profits until the rate falls towards its competitive level (Porter, 2008). In many industries, however, new entrants have a relative disadvantage over existing firms in terms of unit costs due to economies of scale. The threat of entry depends on the entry barriers in that industry and the reaction of the existing companies from the newcomers. The threat of entry, not when entry occurs, is what keeps profitability low.

The seven major entry barriers are economies of scale, customer switching costs, capital requirements, absolute cost advantages, access to channels of distribution, governmental and legal barriers, and retaliation (Porter, 2008).

Bargaining Power of Suppliers:

Since raw materials, semi-finished products, and components are often commodities supplied by small companies to large manufacturing companies, these suppliers usually lack much bargaining power. However, suppliers can have a strong bargaining power when the number of suppliers is limited and/or when the switching cost is high (Porter, 2008). In cases like these, suppliers will have more bargaining power and can command higher prices and greater profitability.

The Bargaining Power of Buyers

The flip side of powerful suppliers is powerful buyers. Customers who have a lot of influence from their suppliers can force down prices and command better quality or more services thus driving up costs and generally forcing industry participants to compete against each other resulting in lower profitability for the entire industry. Powerful buyers put pressure on industry participants by use their negotiating leverage to reduce prices (Porter, 2008).

Many suppliers try to reduce buyer clout by marketing their products directly to the end users. Using this pull strategy, suppliers advertise their products to end users hoping they will request it from retailers who, in turn, demand it from distributers and wholesalers, thereby, pulling it through the distribution channel all the way back up to these suppliers.

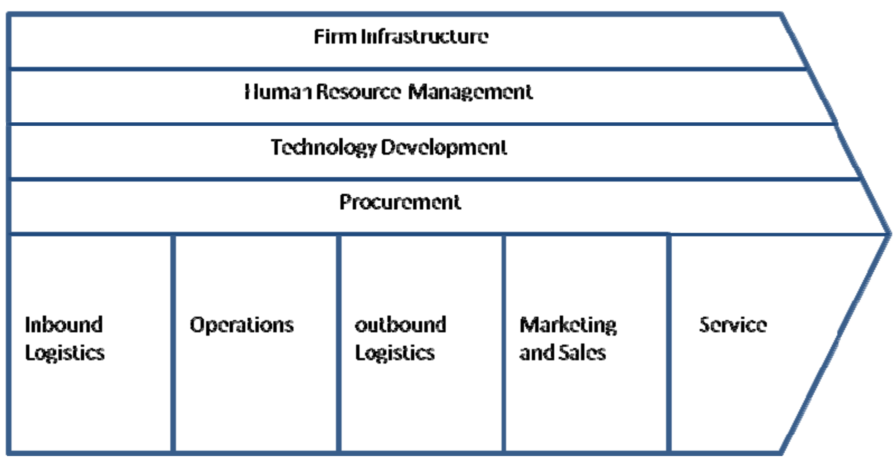
Rivalry among Existing Competitors

Rivalry among existing competitors takes many different forms including price reductions, entry of new products, advertising campaigns, and service improvements (Porter, 2008). Rivalry between competitors reduces the profitability of companies. The extent to which profit is limited depends both on the intensity and on the source for which they compete.

Porter’s five forces model was flawed due to the lack of a mathematical framework to support it (Grant, 2002). The model is also focused on the competition at the industry level and does not get into differences between companies competing within the industry and the dynamic nature for the competition between them. The telcom industry, for example, is a very dynamic industry due to the vast changes in technology and the forces impacting the industry. Technological innovations, standardization, and regulatory mandates are some of the forces that can affect the competitive landscape in the telecom industry. Furthermore, resources directly affect the competitive position of any firm, and the trend in the telcom industry is to rely more on outsourcing, partnerships, and alliances. Therefore, it is important to understand the value chain model and the value network model which consider these factors.

2.5 Value Chain and Value Network

Ansoff (1979) states that firms are supposed to create value throughout the value chain for customers, owners, personnel, and society. The value chain can be described as the chain of processes that create and deliver value to customers. The model for value chain was introduced by Porter (1985) as an assessment business tool to understand how firms should position themselves strategically in the industry amongst their suppliers and existing or future competitors. He proposed the value chain as a tool for identifying ways to create more custome value.



Source: Adapted from Porter, 1985

Figure 2.2 Porter’s Generic Value Chain

Porter (1985) argued that value chain disaggregates a firm into its strategically relevant activities in order to understand the behavior of costs and the existing and potential sources of differentiation. He originally designed the analysis to examine organizational production and support processes and their contributions towards developing greater competitive advantage. He argued that a value chain could represent all the value activities that are performed to design, produce, market, deliver, and support its products.

The value chain identifies nine strategically relevant activities that create value and cost in a specific business (Porter, 1985). The nine value-creating activities consist of five primary activities and four supporting activities. A diagram for Porter's value chain is shown in figure 2.2.

Porter's value chain model has been criticized of having several limitations and that it requires revisions. One relates to the concurrent nature of the value creation activities where they are sequential in Porter's model (Vesa, 2003). Another limitation is that the model does not include relationships with partners in the value creation process (Kothandaraman and Wilson, 2001). The later limitation was addressed with the value network model.

The value network model was developed to expand the scope of the value chain model to include partners in the industry. In order for a firm to be successful, it needs to look for competitive advantage beyond its own operations, into the value chain of its suppliers, distributors, and customers. Many companies today have partnered with specific suppliers and distributors to create a superior value-delivery network (also called supply chain) (Magnet, 1994).

Berger (1996) defined three types of the value network: captive value networks, relational value networks, and turnkey value networks. In the first, smaller suppliers are dependent on larger firms, while there is mutual dependence in the second, and in the third an end to end solution is provided by highly qualified suppliers.

2.6 Business Models

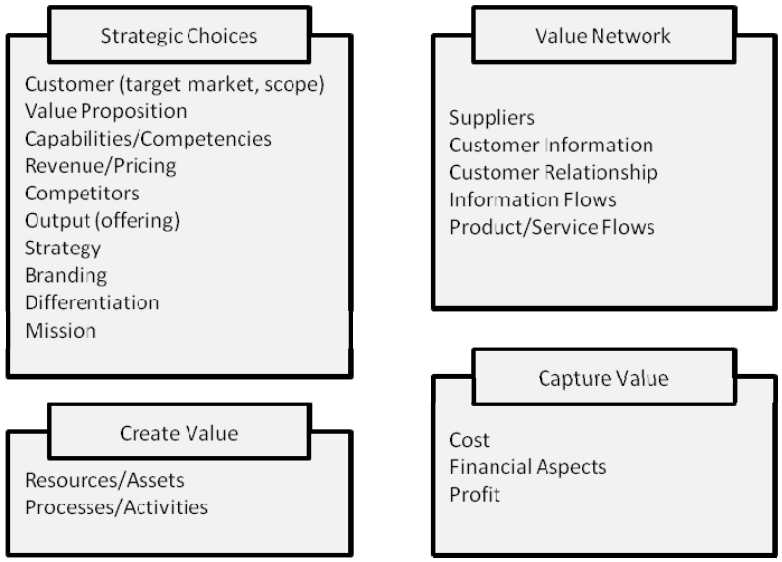
The strategic position of the firm in the industry and in the value chain is defined by the firm's operating business model (Chesbrough, 2006). Despite the increased use of term business model in theory and practice, but there is no agreed definition or framework for the concept (Shafer *et al*, 2005). In fact, Porter has argued that "*the definition of a business model is murky at best. Most often, it seems to refer to a loose conception of how a company does business and generates revenues*" (Porter, 2001, p. 73).

According to Muehlhausen (2008), a business model is the proprietary methodology used to acquire, service, and retain customers. The description used by Muehlhausen is meant to emphasize the uniqueness of the adopted business model to the organization. Osterwalder and Pigneur (2010) further elaborate that a business model should describe the rational of how an organization creates, deliver, and captures value.

Hamel (2000) states that a business model is simply a business concept that has been put in practice, and business concept innovation is the capacity to imagine dramatically different business concepts or new ways of differentiating existing business concepts. Hamel adds that competition within a broad domain, in any field, takes place not between products or companies, but between business models. This should not be surprising since the business model for each company would include key strategic elements such as target customers, value proposition, revenue streams, resources, partnership, and cost structure (Osterwalder and Pigneur, 2010). These elements would determine the competitive position of the organization. Therefore, it is critical for the organization to craft the right business model to continue to revise it according to any observed changes and trends in the industry where it competes.

Similar to the variations in the definitions of business models, different authors have proposed different components for a business model. Figure 2.3 shows an example for business model components as defined by Shafer *et al* (2005). The proposed components of a business model involve the management strategic choices, the process of creating and capturing value, and the functions involved in the value network.

Alternative approaches by other authors for the components of a business model involved processes and activities. An interesting approach was proposed by Chesbrough and it involved opening the business model. This approach will be discussed in the Open Innovation section.



Source: Adapted from Shafer *et al*, 2005

Figure 2.3 the Business Model Components

2.7 Competitive Advantage

Porter (1990) postulates that a nation's competitiveness depends on the capacity of the industries in it to innovate and upgrade. At the same time, companies achieve competitive advantage through acts of innovation, which includes new technologies and finding new ways for doing things. Besides having new and/or proprietary technologies, most competitive advantages are obtained through the process of acquiring customers and achieving economies of scale (Greenwald, 2005).

Competitive advantage was defined by Grant (2002: p. 227) as follows: "*When two or more firms compete within the same market, one firm possesses a competitive advantage over its rivals when it earns (or has the potential to earn) a persistently higher rate of profit*". So, the competitive advantage relates to the ability of the firm to outperform its rivals in performance. It represents the value that the organization creates to differentiate itself from its rivals and survive in a dynamic and competitive market, and it stimulates "creative destruction", innovation, and continuous improvement within the organization (Pereira *et al*, 2011).

Porter (1980) argues that competitive advantage is driven by industry structure. He defined three strategies to determine how a company is positioned and influenced by the industry's structure. These strategies are: differentiation, cost, and focus. The competitive strategy along with the industry structure would determine the competitive advantage and the expected performance and profitability of the company (Porter, 2004). Porter's work was contradicted by Grim, Lee *et al* (2005) who stated that competitive advantage and the expected performance and profitability would be based on decades of theoretical and empirical research and theory and practice should go hand-in-hand. They added that the theoretical work in the literature can help to understand the nature of competition in an industry and how firms might achieve a competitive advantage but the empirical research should not be neglected. The empirical work might bring new information on how to exploit opportunities in the industry. Having such information that is not available to rivals can be an important source for creating and sustaining competitive advantage (Pereira *et al,* 2011).

A different approach that is considered as a complement to Porter's theory of competitive advantage is the Resource-Based View (RBV) of the firm. RBV focuses on the firm's internal resources and the competition with other firms based on their resources as a way to gain competitive advantage (Barney, 1991). RBV assumes that firms are fundamentally heterogeneous when it comes to their resources and internal competencies and capabilities, and the firm needs to know how to use its internal resources to gain sustainable competitive advantage (Barney, 1991). Barney (1991) has identified four attributes for a resource to be a source for competitive advantage:

1. Valuable: in exploiting opportunities or neutralizing threats
2. Rare: among the firm or its rivals
3. Imperfectly imitable
4. No strategically equivalent substitute

The RBV theory is criticized for focusing only on internal resources of core competencies. It is argued that this approach would limit the firm's reach to learn new competencies (Korsaa and Jensen, 2010).

Regardless of the source of competitive advantage, it can largely be attributed to the ownership of a valuable resource that enables the company to perform better than its competitors (Collins, 1995). Competitive advantage erodes over time by the competition in the industry. This brings the challenge of creating a sustainable competitive advantage. Although the term sustainable competitive advantage was first mentioned by Porter (1985), but was first defined by Barney who associated the term with the creation of value ahead of rivals or based on resrources that rivals don’t have. Hoffman (2000: p. 6) defined sustainable competitive advantage as “prolonged benefit of implementing some unique value-creating strategy not simultaneously being implemented by any current or potential competitors along with the inability to duplicate the benefits of this strategy.

The company may sustain the competitive advantage if it continues to upgrade it. To do so, the company has to have enough leadership to create and sustain a dynamic and challenging environment where innovations can be created to fuel the company’s competitive advantage. However, the competitors have heard the same message and they can replicate any competitive advantage quickly. The company has to have a significant size in its market and the competitors need to be limited in their options in order for the company to have a sustainable competitive advantage (Ghemawat, 1986).

In order for any organization to sustain its competitive advantage it has to establish barriers to the competition to prevent or delay as far as possible as potential imitation. Rumelt (1984) has used the concept of “isolating mechanism” to describe the barriers that can limit the imitation. The process of competitive imitation was described by Grant (2002) as he listed the four conditions of imitations:

1. Identification: that a company has a significant advantage
2. Incentive: that be imitating the rival company can also acquire the same competitive advantage
3. Diagnosis: of the strategy that is resulting in the competitive advantage
4. Resource Acquisition: replicating or transferring the needed resources to imitate the strategy

Traditional models of how firms build an advantage were the drivers behind developing the concept of sustainability or advantages that rivals cannot overcome. D'Aveni (1994), for example, effectively argues that attempting to build a sustainable advantage in high competitive situations is a distraction requiring misappropriation of resources that are needed in an intense competitive environment. Trying to extend existing competitive advantages will hinder the process of building new ones when the environment is too competitive and advantages erode quickly.

When it comes to building a sustainable competitive advantage, Hamel (2000) argues that the age of continuity is over and the value of incumbency has eroded. Hamel (2000) states that revoluntionary firms that will emerge as winners will have to embrace change through innovatory business concepts in new business models. Innovation is not limited to embodying new ideas and knowledge in products and services, but extends to embody new approaches to doing business and the overall business model.

2.8 Blue Ocean Strategy

Blue Ocean Strategy, also known as BOS, emphasizes on pursuing a low cost and differentiated strategy simultaneously (Kim and Mauborgne, 2004b, 2005). It states that firms should raise the standard of activities higher than the industry standard and offer their customers higher value than their competitors.

The strategy basically steers companies away from head-to-head competition which can be mutually destructive and would lead to a "red ocean" that bleeds the company's resources and erodes any potential profitability. Unfortunately, many trends in the industry such as globalization and technological advancements will make supply exceed demand. This results in the commoditization of the products and the creation of Red Ocean where competition is mostly based on price. BOS teaches that success comes not from battling competition but from making the competition irrelevant. Direct competition in a mature market inhibits value creation. The Red Ocean will never go away, but competing for a share of contracting markets will not result in a sustainable high performance. Therefore, to seek new profit and growth opportunities, companies need to also create blue oceans. A comparison between the Red and Blue Ocean strategies is shown in figure 2.4.

Red Ocean Strategy	Blue Ocean Strategy
•Compete in existing market space	•Create uncontested market space
•Beat the competition	•Make the competition irrelevant
•Exploit existing demand	•Create and capture new demand
•Make the value-cost trade-off	•Break the value-cost trade-off
•Differentiation or low cost	•Pursue differentiation and low cost

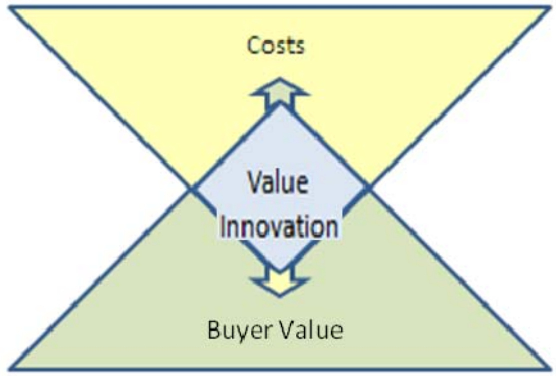
Source: Adapted from Kim and Mauborgne, 2005: p. 18

Figure 2.4 Comparisons between Red Ocean and Blue Ocean Strategies

Innovation that does not result in products that customers are willing to accept and pay for is usually technology driven and market pioneering but without any value creation. Value innovation occurs only when companies align innovation with utility, price, and cost positions (Butler, 2008). This is created when the innovation changes both the cost structure and the value proposition in a favorable way to buyers. Cost savings are made by eliminating and reducing the factors an industry competes on (Kim and Mauborgne, 2005). Buyer value is lifted by raising and creating elements the industry has never offered. Over time, costs are reduced further due to the economies of scale and the high sales volumes that superior value generates. Value innovation is achieved only when the company's utility price and cost activities are properly aligned.

One of the key tools to check the value creation is the strategy canvas (Kim and Mauborgne, 2005). The strategy canvas is both a diagnostic and an action framework for building a compelling blue ocean strategy. It serves to compare the new product to existing products across multiple criteria to see if a superior value is created.

To implement BOS, it is recommended to raise a small number of activities in the value chain well above industry standard, reduce activities that fall below industry standard, eliminate activities that industry take for granted, and create innovative activities that the industry has never offered (Mohamed, 2007). The first two drop the cost structure and the second two provide insights on how to lift buyer value and create new demand. Figure 2.5 illustrates how reducing cost and increasing buyer's value would lead to value innovation.



Source: Adapted from Kim and Mauborgne, 2005: p. 16

Figure 2.5 the Simultaneous Pursuit of Differentiation and Low Cost

The following steps should be followed to formulate a Blue Ocean Strategy (Kim and Mauborgne, 2005):

1. *Reconstruct market boundaries:*
   The business model will have to be completely reshaped to evaluate all the old assumptions and consider the current key competitive drivers (such as customer preference, product quality, price, industry standard, etc). A strategy canvas needs to be created to graphically display these factors.

2. *Focus on the big picture, not the numbers:*
   It is very easy to get lost in numbers, but the key thing is not to get bogged down by them and miss where the industry and the competitors are heading. The strategy canvas would show the value curve and indentify possible opportunities.

3. *Reach beyond existing demand:*
   Real growth lies beyond existing demand. To maximize the size of the created blue ocean, companies need to abandon conventional strategy of just focusing on existing customers. Instead, they need to reach noncustomers and build powerful commonalities in what buyers value. This enables them to unlock a new mass of customers that did not exist before.

4. *Get the strategic sequence right:*

   The strategy needs to be executed sequentially to achieve the "value innovation". Technological innovation does not necessarily lead to value innovation. The product usefulness and value need to be assessed to see how customers will buy it and use it. We should determine why customers will buy it and use it, and if it brings exceptional utility. We should also set the unit pricing and see if it appeals to the larger audience, and find if profitability will be created and the factors that would discourage the acceptance of the product.

When it comes to executing the Blue Ocean Strategy, the following two items need to be addressed (Kim and Mauborgne, 2005):

1. *Overcome key organizational hurdles:*

   Key internal departmental differences need to be resolved. People will question the new strategy and will resist the change. The employees need to understand that there is a strategy shift and they need to adapt to it. Another hurdle is the limitation in the resources needed to execute the strategy. The third hurdle is how motivated the employees are to shift from their status quo. The final hurdle is the politics involved in implementing any change in the organization.

2. *Build execution into strategy:*

   The strategy needs to be built into the company's ongoing processes. Since it involves risks, it is important to build trust among the key stakeholders since it requires an extra effort from a unified crew.

There is no permanently excellent industry or permanently excellent companies. Sooner or later imitators will appear on the horizon. However, companies can enjoy the benefits from the created blue ocean due to the barriers that Imitator will face. The barriers include low cost structure because of the economies of scale, network externalities, brand image that will discourage imitators, and organizational and political barriers that imitators will face in copying the same strategy.

An empirical illustration of the BOS in telecommunications is NTT DoCoMo's i-Mode which was launched when the competition was intensified and the profitability was eroding. The i-Mode gave mobile users access to only popular data and websites while adding a small premium to the price of a regular mobile phone. The price was still much cheaper than having a PC while enjoying the mobility of a mobile phone. The interface was very simple and the charges on certain features or special access were integrated with the monthly billing. The number of subscribers reached over 40 millions within four years, and the revenues increased from $2.6 millions in 1999 to $8 billions in 2003 (Kim and Mauborgne, 2005). The growth did not come from fighting competitors over customers, but came from dramatically growing the market by demonstrating superior understanding for the technology capability and the customers' needs, and also by breaking the cost-value tradeoffs.

2.9 Open Innovation

Traditional business strategy has guided firms to develop defensible positions against the forces of competition and power in the value chain, implying the importance of constructing barriers to competition, rather than promoting openness. If we are to make sense of innovation communities, ecosystems, networks, and their implications for competitive advantage, a new approach to strategy is needed. This is called "open strategy" by using "open innovation" (Chesbrough, 2007). In this kind of innovation, the company can benefit from the openness as a means for expanding value creation for organizations.

Open strategy balances traditional business strategy with the potential benefits of open innovation. Open strategy also introduces new business models based on invention and coordination undertaken within a community of innovators while keeping a balance between value capture and value creation. Therefore, there are two primary manifestation of openness: open innovation and open coordination (Chesbrough, 2007). Both forms of openness are extremely relevant to the telecom industry and they both challenge traditional business strategies in taking advantage of external resources as sources for value creation to the company. There is a tremendous amount of pooled knowledge created as a result of open innovation that far exceeds any individually obtained knowledge. This leads into a significant value created that can benefit all contributors. Furthermore, open coordination leads into the consensus building needed for technology standards. This results in the creation of ecosystems across multiple industries. A healthy ecosystem can further advance the adoption of open innovation through the network effects, where the value increases with each additional adopter. The value created in the ecosystem will be diffused among the participants.

The shift from ownership to the concept of openness requires reconsideration of the processes for how value is created and captured (Chesbrough, 2011). Examples on that range from social networking websites such as MySpace, to open source software like the Linux Operating System. Other examples include Wikipedia and YouTube. Such innovations were created by collective efforts of multiple parties for the public good.

Open innovation represent a new phenomena that requires a rethinking of strategy in key components such as ownership, entry barriers, switching costs, and intra-industry rivalry (Chesbrough, 2011). The concepts of open source development, open innovation, intellectual commons, peer production, and collective invention all deviate from traditional strategy models and represent the new trend that affect all industries, mostly information and telecommunication industries. For example, Microsoft was applying the concepts of Porter’s five forces, but that did not stop or slow down the emergence of companies like Google and Yahoo. Furthermore, despite the low switching cost and low entry barriers, the industry profitability was not impacted much and companies like Google and Yahoo have become very profitable.

There are some issues and challenges associated with the open innovation process. For example, when the knowledge is shared and a value is created, how can companies capture the value and differentiate themselves from other players in the ecosystem? Other issues are related to the common problems in any joint collaboration where parties tend to abandon the collaboration once they feel they acquired the knowledge they needed from other parties in the collaboration. Furthermore, in order for companies to protect their star employees from being “head-hunted” by the competition in the ecosystem, they tend to send tier two employees, which might affect the quality of the final product. All these issues make open initiative very hard to sustain over time.

Despite the mentioned challenges, open innovation is a very viable option especially in tough economic conditions. This enables the company to pursue opportunities without having to invest a significant amount of capital, and at the same time, it lowers the risk associated with the investment they make. The followings are inside-out strategies that can help the company share investment and development with the industry while maintain some equity (Chesbrough, 2009):

1. *Become a customer or supplier of a former internal project:*
   When the company and others in the industry are pursuing similar activities, it makes sense to join forces with them.

2. *Let others develop nonstrategic initiatives:*
   Complementary initiatives can drain the company’s resources. In this case, it would be best for the company to focus on its core activities and let other companies handle the development burden of nonstrategic initiatives.

3. *Make intellectual property work harder for everyone in the industry:*
   Intellectual property is only valuable if it is continued to be developed and produce revenue to the company. If the company is not able to continue the development or benefit from what was already developed, it makes sense to let others utilize the intellectual development in exchange of royalty fee.

4. *Grow an ecosystem, even if the company is not growing:*
   It is very important for innovative companies to continue to promote the growth of ecosystem around their technology and products. This could serve as a long term strategy that can tremendously benefit the company on the long run

5. *Create open domains to reduce costs and expand participation:*
   Establishing domains can help turning ideas into realities at the lowest possible cost by benefiting from exchanging ideas with other players in the industry and sharing facilities and resources.

These inside-out strategic initiatives come with many cultural, political, organizational, and human resources challenges. However, they can provide a significant leverage to companies trying to weather severe economic downturns without compromising their future.

2.10 Critical Success Factors

The Critical Success Factors (CSFs) (a.k.a. Key Success Factors or KSF) concept is not new and it might go back to Aristotle who noted that organizations fare better when leaders create simple goals (Forster and Rockart, 1989). Drucker (2002) elaborated further on the concept noting that successful executives shold focus their time and energy on a very small number of critical problems or opportunities and delegate or eliminate other things.

The concept was adopted and further expanded in modern management. According to Bullen and Rockart (1981), CSFs are the limited number of areas in which satisfactory results will ensure successful competitive performance for the individual, department, or organization. CSFs are the few key areas where “things must go right” to flourish and for the manger’s goals to be attained.

The CSF approach is highly effective in helping executives define their significant information needs. They are factors considered critical to the success of the organization and require special attention to bring high performance to the organization. It is also efficient in terms of the time needed to develop them. The approach is based on the “success factors” concept developed by Ronald Daniel (1961), but has evolved over the years.

There are four prime sources of CSFs (Rockart, 1979):

1. Structure of the particular industry: the company must observe the unique CSFs required for its industry
2. Competitive strategy, industry position, and geographical location
3. Environmental factors: the macroeconomics and political environment can influence the company’s CSFs
4. Temporal factors: these factors are only critical for the company for a period of time and usually they are below the level of acceptability outside that time.

There are internal (related to people and departments) and external (overall organization) CSFs, and there are implicit and explicit CSFs (Bullen and Rockart, 1981).

CSFs are usually developed in a process that involves interviewing the executives and the key stakeholders to determine that factors that enable the organization achieve its goals (Rockart, 1979).

Identifying CSFs is critical to any organization and if they are not achieved the consequences can be catastrophic to the organization (Rockart, 1979). CSFs are also considered a key component in the strategic information management which aims to assess an organization's performance and competitive ability (Houtari *et al*, 2001). The CSFs concept was combined with the value chain concept by Porter (1985). The idea was to identify the critical areas within the value chain by using CSFs to find the corporate information needs that need to be satisfied in order for the organization to achieve its strategic goals. Once the critical areas of the value chain are identified, the efforts will be concentrated on them to ensure the overall success of the organization.

The CSF concept is currently used extensively in the corporate world due to its perceived value to the competitiveness of the organization. This is not limited to managing existing operation but it extends to the adoption of new initiative that is deemed critical to the organization (Ngai, 2007). It has been even suggested that the value of such approach is not limited to large organizations with complex operation, but the approach can be very critical to small and medium enterprises (Sen and Taylor, 2007). Sen and Taylor has found that due to the increased competitive environment of small and medium enterprises, it became imperative for these enterprises to use the CSF approach within a strategic approach to their information needs so they can stay competitive.

2.11 Studies in the Field

The evolution of the telecom industry has been studied in the literature as operators transformed from monopolies into companies competing with many rivals. The transformation of the telecom industry was argued to be fueld by the globalization trend that started rising in the 1980 and intensified in the 1990s (Trauth and Pitt, 1992).

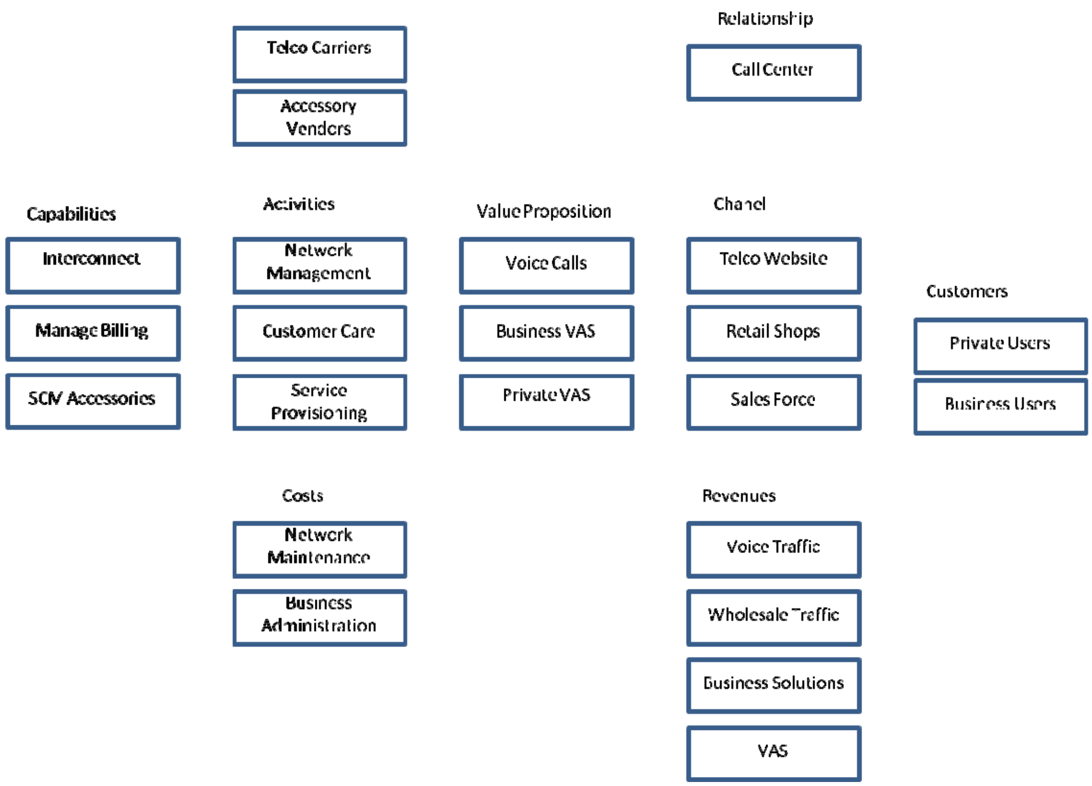
The telecom industry has also been studied from the macroeconomics point of view. The big event was the boom and bust of the Internet bubble in the late 1990s and early 2000s, and the significant impact on the telecom industry. Fransman (2004) attempted to identify the phases involved in the boom and bust and tried to establish mechanism and processes that can help identify any similar future events. Establishing pragmatic predictive models is challenging due to the role of excessive liquidity, greed, and panic in booms and busts.

The telecommunication industry has evolved tremendousely since the Internet bubble burst. Steinbok (2005) has defined the wireless part of the industry as a dynamic business that moved through three stages: monopoly (pre-cellular and 1G), transition (2G), and competition (3G and beyond).

Steinbok added the concept of evolution to the value creation process. The transformation in the telecom industry from value chain to value network was studied by Li and Whalley (2002), and they stated that the transformation is not only evident in the whole industry, but also in the submarkets.

The rivalry in the telecom industry has intensified significantly also since the Internet bubble burst (Emm *et al*, 2007). One of the drivers behind intensifying the competition was the deregulations and the regulatory unbundling mandates (Gorp and Middleton, 2010). These mandates, like the local loop unbundling, were aimed to increase the level of competition to stimulate broadband investment, avoid duplication of infrastructure, and reduce broadband connectivity prices to consumers. It was founded that the network economics allow competition between two to four operators in any geographical region (Soria and Hernandiz-Gil, 2010).

Companies in the telecom industry have been competing to service customers and try to differentiate themselves through customer satisfaction. Some argue that customer satisfaction alone is not sufficient to guarantee the company's survival (Hu *et al*, 2009). However, enhancing customer perception and experience along with the quality of the delivered service would directly impact the customer loyalty and reduce churn. Pagani (2005) highlighted the importance of securing attractive contents to having a competitive advantage to retain customers and minimize churn (Pagani, 2005).

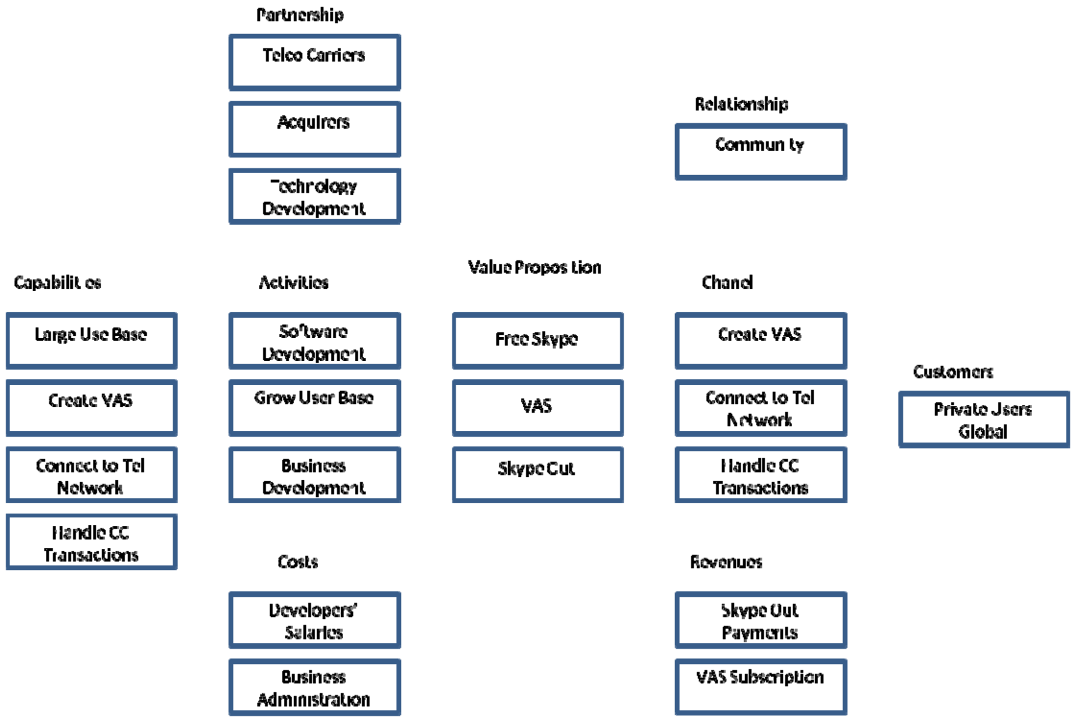


Source: Adapted from Osterwalder *et al*, 2005

Figure 2.6 Elements of a Traditional Telco's Business Model

It has been suggested that the proliferation of the Internet was the main driver behind the strong emergence of the business model concept (Shafer *et a*l, 2005). The concept is very applicable to telecom companies due to the changes in the environment where telecom companies operate. There is no standard business model for traditional telcom operators, but a model illustrated in figure 2.6 was proposed by Osterwalder *et al* (2005).

The work of Osterwalder *et al* was extended further to illustrate the business model of Skype, one of the main OTT companies providing voice calls over the Internet. The business model of Skype is shown in figure 2.7.



Source: Adapted from Osterwalder *et al*, 2005

Figure 2.7 Elements of Skype's Business Model

When we compare the two business models we find big difference most notably in the cost structure, value proposition, and target customers. Perhaps the success of Skype can be attributed to some of these differences. Skype operates at a fraction of the cost for any traditional telco since it is mainly a software company and does not really own a physical telecom network (Osterwalder and Pigneur, 2010). Despite the significantly lower cost, their target market has no geographical limitation as their business model relies on having a global reach. The differences between the two business models highlight some of the challenges that telcos have in facing the emerging competitors from the Internet proliferation.

An important platform for helping telcos improve their service to their customer is the Customer Relationship Management (CRM) platform. Operators have invested heavily in developing and enhancing the platform to differentiate their service and improve customer retention (Unnithan *et al*, 2007). The CSF approach is used extensively by telecom organizations to manage the information needs of executives for new initiatives.

Unnithan *et al* (2007) have demonstrated how to use Bullen and Rockart (1981) model for the classification of CSFs, and they were able to identify the critical areas for implementing a mobile CRM platform by a telco.

The telecom industry is heavily dependent on technology and innovations. However, a comparative analysis study showed that the telecom innovation investment strategies have provided telecom companies fewer benefits than companies almost in every other sector (Hicks, 2001). This makes it even more challenging for companies to continue to invest in research and innovative initiatives. Therefore, Open innovation is an interesting proposition due to the benefits spread across all participants.

2.12 Summary

This chapter has presented an overview and a summary of the most relevant literature that makes the theoretical foundation for the work in the subsequent chapters. We have found that it is very important for a firm to create a unique and valuable position with the goal to maximize profit. Porter’s forces of competition model were reviewed and we found that companies can achieve competitive advantage by recognizing the industry structure and position themselves accordingly. According to Porter, competitive advantage is driven by industry structure. The competitive advantage erodes over time by the competition and only revolutionary firms that embrace change through innovative business models would emerge as winners.

The importance of the value chain and value networks in the value creation process was highlighted. It was found that the firm’s strategic position in the industry and in the value chain is defined by its operating business model. Hamel argued that competition is not only between products and companies but between business models. BOS strategy was reviewed as a different approach that firms should pursue to maximize profit. In BOS, companies should pursue low cost and product differentiation simultaneously and create uncontested market space by creating new demand through value innovation.

Open innovation enables firms to break the cost-value tradeoffs by expanding the value creation for firms. This approach involves a new business model based on invention and coordination within a community of innovators while balancing value creation and capture. To measure the competitive performance of a firm, CSFs are most commonly used by executives due to the direct correlation they have to the firm's goals.

The review highlighted in this chapter will facilitate the research in the subsequent chapters for the current status of the telcom industry and the competitivenss of telcos, and the applicability of some of the recent strategy work, such as BOS and Open Innovation, to telcos' future business model.

Chapter 3

Telecom Industry Structure and Trends

3.1 Introduction

In reviewing the literature in chapter 2, it has been found that it was critical for the firm to identify a unique and valuable position within the industry in order for it to maximize its profit potential. At the same time, creating a competitive advantage involves cost leadership and differentiation and an overall a superior value creation process than what competitors offer.

In order for telecom companies to maximize their profit potential, they need to understand the competitive forces, the value chain, and the emerging trends in telecom technology and industry. The challenge that telcos face is that the telecom industry is very dynamic and technology-dependent. Therefore, operators have to be vigilant to the trends and the evolution of competition in the industry and the business model has to change accordingly.

This chapter explains how the telecom industry was formed and provides a technical background on a typical network of a telco. The structure of the industry is characterized along with the competitive forces and the existing competitive position of telcos. Finally, the main trends in the telecom industry will be highlighted and discussed. These trends can present operators significant challenges. But if operators identify these trends and position themselves strategically, they could turn these challenges into opportunities.

3.2 Industry Background

This section provides a historical evolution background on the formation of the telecom industry, and a technical background of a typical telco's network.

3.2.1 Telecom Industry Formation

Tracing back the history of telecommunications can take us into a long journey back in time. It goes back to the usage of smoke and drums, the formulation of Maxwell's equations, the invention of Alexander Graham Bell's phone, and the successful transmission of Marconi's first transatlantic signal. Many scientists, inventors, and pioneers contributed along the way to make telecommunications a reality and a utility that is essential in every household around the globe.

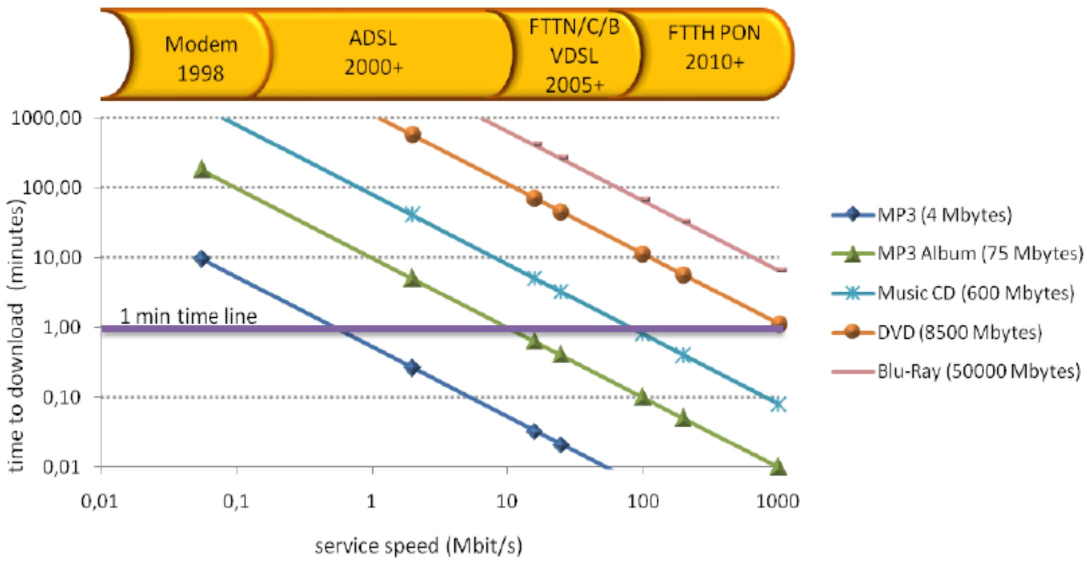
Perhaps one of the major drivers in the creation of the telecommunications industry was the expiration of Graham Bell's second telephone patent in 1894 which led within a decade to the creation of over 6,000 companies to compete in the United States. American Telephone & Telegraph (AT&T), the company that was formed based on Bell's patent, was granted a monopolistic power in 1913 in exchange for allowing non-competing companies connect to its long-distance network (AT&T, 2011). This decision was reversed in 1982 in an anti-trust case that led to the breakup of AT&T parent company and the establishment of several regional Bell operating companies (baby Bells), and made AT&T focus solely on the long distance business. The breakup was intended to protect consumers and encourage competition in the telecommunication sector.

The cable industry, which has been responsible of providing video signals to households, had a later start. Although there were several successful transmissions of video as a signal earlier in the 20th century, but the cable industry was not formed until late 1940s to serve communities (Federal Communications Commission, 2000). These communities were not able to receive video signals either due to the terrain or because of their remote locations. Video signal transmission over satellite was not available to consumers at the time. Broadcasters had to use antenna towers that they erected at high elevation to cover populated areas. Therefore, companies started putting antennas in areas that can have good reception, and they used coax cables as a transmission medium to carry the video signals to remote communities. This was referred to as Community Antenna Tele-Vision or CATV.

As video contents got more advanced and the number of channels drastically increased with exclusive availability to cable subscribers, CATV service was no longer specific to remote communities but became ubiquitous across the United States and other countries. The number of communities served grew from 70 communities in 1950 to more than 32,000 communities and 65 million subscribers in the U.S. in 1998 (Federal Communications Commission, 2000). Driving this growth for CATV was the superior signal quality which does not get impacted by the environmental conditions. Also, the cable medium is capable of carrying more channels than the over the air transmission. Finally, the lack of restrictions on contents enabled broadcasters to build their business model around premium channels that contain major events, hot releases, and age-restricted contents.

Telephone and Cable companies operated peacefully side-by-side for a long time since they offered different products. Telephone companies were providing telephone service over their copper network and cable companies were providing their video service over their coaxial network. The emergence of the Internet broke the competition wall and both types of companies started racing to offer a better broadband service that is far superior to the, so called, “world-wide-wait” dial-up service that dominated in the early days of the Internet.

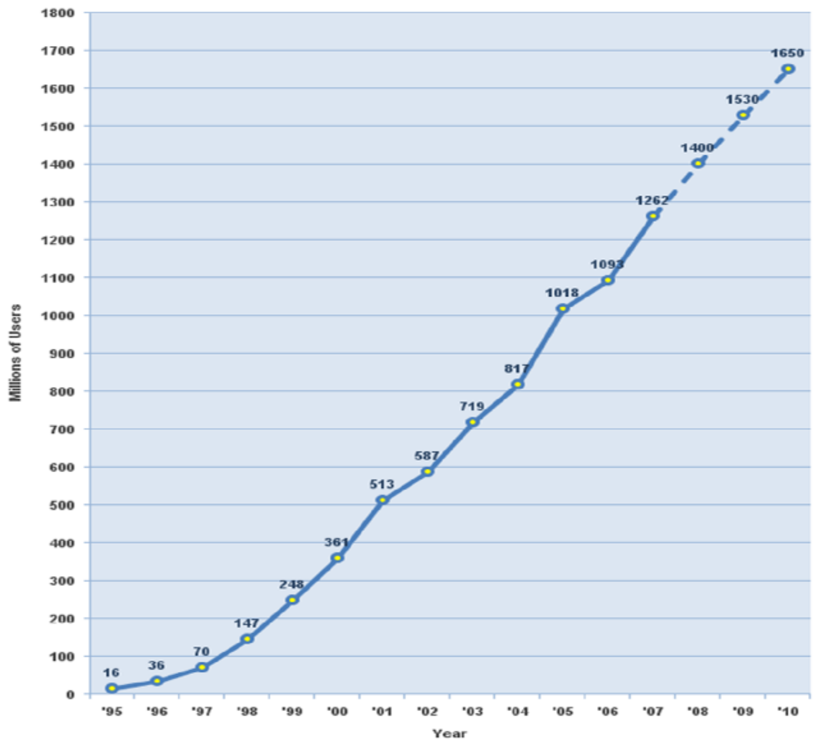
The Internet usage pattern has changed dramatically over the years (Teixeira, 2010). It was mainly developed for file transfers but the killer application ended up being electronic mail. The development of the World Wide Web (WWW) turned the usage into web browsing. As the contents of websites got more sophisticated with advanced multimedia elements, the Internet traffic started soaring which triggered innovation to get the maximum possible speed from existing networks beyond the 56 Kbps speed that dial-up can offer. Both Telephone and Cable companies got creative by using advanced modulation schemes to enable them to provide the maximum possible Internet access without having to change their existing infrastructure. So telephone companies continued to use copper networks to provide broadband DSL Internet along with the legacy telephone service, and cable companies continued to use coax cables to provide broadband cable model Internet along with the legacy CATV service. The capability of the different technologies is illustrated in figure 3.1.



Source: Teixeira, 2010

Figure 3.1 Download Times for Different Technologies

The emergence of the Internet created a big competitive environment between operators that previously provided completely different services. But this competition got significantly more intense when the telecom industry got deregulated in the U.S. in 1996. The deregulation widened the scope of the competition field to include many new entrants. Regulatory authorities in most advanced countries felt that this is the best way to expedite the proliferation of this new technology due to the significant value of broadband to the overall economy and the national competitive advantage. As shown in figure 3.2, the number of Internet users globally grew from 16 Million users in December 1995, which was 0.4% of the total population at the time, and was anticipated to hit 2.1 Billion users in June 2011, which is 30.4% of the total population (MMG, 2008)



Source: MMG, 2008

Figure 3.2 Global Internet Users Growth 1995-2010

The deregulation of the telecom industry in the United States happened with the Telecommunications Act of 1996, which caused a drastic change in the landscape of the telecom industry in the U.S. The Telecom Act of 1996 was intended to promote competition between telephone companies, cable companies, and long distance companies by defining procedures to eliminate barriers between these industries (Federal Communications Commission, 1996). This resulted in the creation of many companies that took advantage of the infrastructure sharing regulatory rules by placing their equipment in the facilities of the incumbents and transmissting their traffic through the incumbent’s network to target customers. The incumbents were referred to as ILECs (Incumbent Local Exchange Carriers) and the new entrants were referred to as CLECs (Competitive Local Exchange Carriers).

Deregulation of the telecom industry happened also in other parts of the world (Gorp and Middleton, 2010). Some countries had one national company with a complete monopolistic power. The national companies ended up getting privatized as the industry was open to competition. Several unbundling models have emerged, and some European markets, like Sweeden and Netherlands, became hypercompetitive which stimulated broadband deployments in these countries (Forzati *et al*, 2010).

Deregulations stimulated the competitive race between all companies to invest in new technologies by borrowing money to offer best-in-class technologies to deliver to the promises of the Internet. The excessive liquidity in the telecom industry led to the Internet bubble where these companies got ahead of themselves and did not have enough revenues or solid profits to sustain their operation and justify the speculation about their growth. This led to the bubble burst and a subsequent consolidation in the industry.

Old Telecom Industry	*Info-Communications Industry*
Closed innovation system	Open innovation system
High entry barriers	Low entry barriers
Few innovators	Many innovators
Fragmented knowledge base	Common knowledge base
Medium-powered incentives	High-powered incentives
Slow, sequential innovation	Rapid concurrent innovation

Source: Adapted from Fransman, 2002

Table 3.1 Comparisons between the Innovation Systems in the Old Telecom Industry and the Info-Communications Industry

The evolution of the telcom industry can be divided into three phases: the Old Telecom Industry, the New Telecom Industry, and the Info-Communications Industry (Fransman, 2002). The first transition happened in the mid 1980s due to political-economic conditions and resulted in ending the telecom monopolies mainly in US, UK, and Japan. The second transition was driven by the proliferation of the Internet which had significant impact on the telecom network and the telecom business (Fransman, 2002). Although these changes happened in less than 30 years, but the differences between the the Old Telecom Industry and the Info-Communications Industry are significant. These differences are summarized in table 3.1.

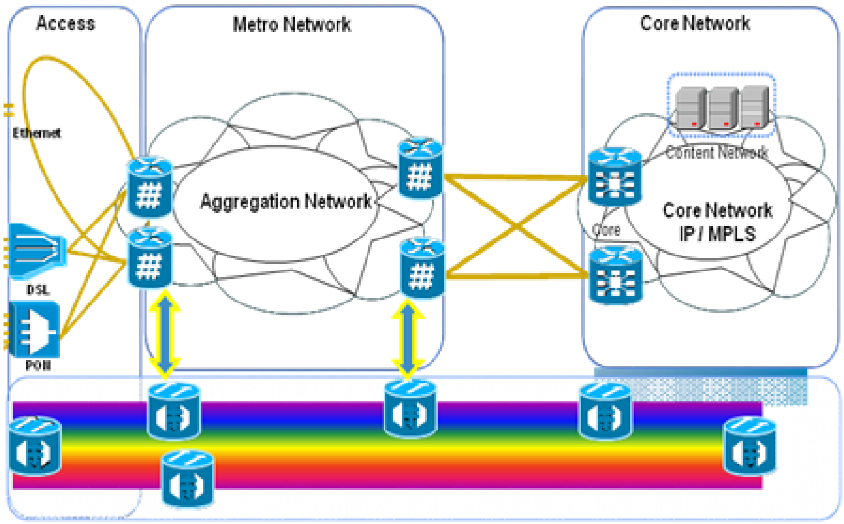
The fast pace of innovation that we are currently witnessing in the telecom industry is largely attributed to the openness in innovation system and the subsequent collaborations between different companies including between rivals and the concurrency of the innovation.

3.2.2 Typical Telco's Network

The architecture of a typical telecom network is shown in figure 3.3 (Cisco, 2011). The architecture can be divided into three main sections: Access, Metro/Aggregation, and Core/transport networks.

The Access network provides the connectivity to subscribers through copper, coax, fiber, or wireless technologies. This includes voice, data, and video services to residential, small and medium businesses (SMB), and large enterprises. Copper and Coax already exist in the network but they are limited in speed, wireless is cheaper to deploy but had limitations due to weather and obstructions, and finally fiber is an outstanding medium but it is expensive to deploy (Opera, 2007). As mentioned earlier, advances in electronics and signal processing has improved the performance of all access tehnologies.

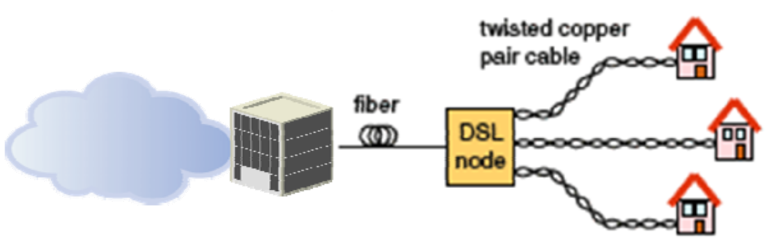
The traffic is aggregated in the central office and sent via Ethernet switches and/or IP routers over WDM transport networks to connect to other central offices on the same Metro network which covers the entire metropolitan area. The transport layer is the colored under-layer in the figure 3.3, and it is designed to provide long distance transport for national and international traffic through the connectivity of the routers in the different segments of the network.



Source: Cisco, 2011

Figure 3.3 Typical Telecom Network

Different Metro networks are connected with routers to each other via a Core network which provides the national coverage for telecom services. The Core Network also has the Content Networks that can stream contents to end users. At the same time, international traffic passes through an Internet PoP (Point of Presence) on the core network. The Internet PoP is the gateway between the national telecom network of an operator and the telecom networks of other international operators. The main function of the Internet PoP is to provide Internet users the necessary access to the global Internet by utilizing points of interconnects between the different operators.



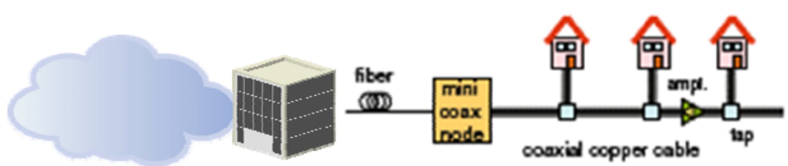
Source: Adapted from Shami *et al*, 2009

Figure 3.4 Legacy Copper Networks

The network of telephone companies has historically utilized connectivity of copper cables all the way from Central Offices (CO) to the customers (Figure 3.4). To support providing broadband Internet service over the bandwidth-limited copper cables, advanced modulation techniques were used such as Digital Subscriber Loop (DSL) with all its different flavors (ADSL, VDSL, etc) (Shami *et al*, 2009).

Since the bandwidth that telcos can provide is limited with DSL technology, operators tried to minimize the length of the copper cable by extending fiber optic cables to a remote terminal (RT) within 5000 feet of the customer (Opera, 2007). This came to be known as Fiber to the Node (FTTN). Alternatively, other operators extended fiber cables to pedestals on the curb and within 500 feet of the customer, and this came to be known as Fiber to the Curb (FTTC) (ITU-T, 2005). The hybrid combination of fiber and copper enabled the operators to use DSLAM (Digital Subscriber Loop Access Multiplexer) technology to extend broadband speeds in excess of 1Mbps without having to make significant investments in the Access Networks to completely replace copper with fiber cables.

Cable operators, on the other hand, have used coaxial networks to provide CATV signals to customers. To get a superior performance from the coaxial network in terms of minimizing the number of external amplifiers which boost the signal but degrade the overall performance, Hybrid Fiber Coax (HFC) Networks were used as shown in figure 3.5 (Shami *et al*, 2009).

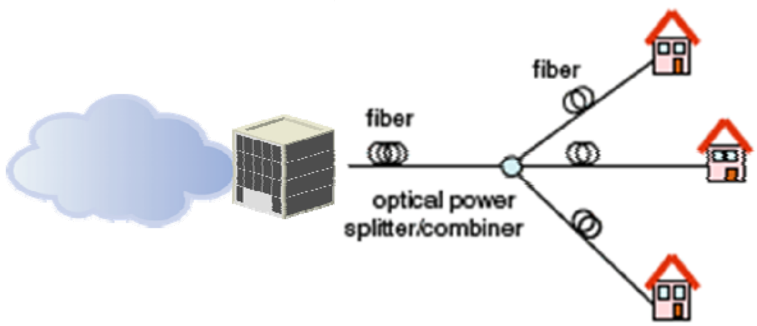


Source: Adapted from Shami *et al*, 2009

Figure 3.5 Legacy Coax Cable Network

In HFC networks, video signals are carried over an optical carrier all the way to a fiber node (typically within 5000 feet of the customer). Then the signal is converted back into an electrical signal that is transmitted over the coax network all the way to the customer. Broadband Internet can be supported on the same infrastructure by using Data over Coax Service Interface Specifications (DOCSIS). The Internet signal in DOCSIS is sent on separate RF carriers upstream and downstream, and the downstream traffic is multiplexed with the RF video signals.

The inclusion of High Definition (HD) video services into the IP world made the legacy Access Networks inadequate to support the exponential future growth in the Internet traffic. Therefore, telcos started upgrading their access networks with fiber optic technology. By doing so, operators were hoping to have a future-proof solution that would cater to current and future needs for higher bandwidth. Fiber networks also enabled operators to introduce interactive video solutions and other "bandwidth-hungry" services that create more revenues from the Internet connectivity (Clarke, 2009).



Source: Adapted from Shami *et al*, 2009

Figure 3.6 Fiber to the Home (FTTH) Network

Fiber to the home networks typically utilize one of two topologies, either point-to-point or point-to-multipoint. In both cases, the network active equipment resides in the central office (Shami *et al*, 2009). Point-to-point networks have direct fiber connectivity from the central office all the way to the premise where active equipments are either inside the customer home or business or at the building. The distribution from the building can be through either copper or Ethernet cables. On the contrary, point to multipoint networks have a common fiber, called feeder fiber, which connects to a passive optical splitter and the distribution to customers come from the outputs of the splitters using distribution optical fibers. No active equipments reside in the OSP (Out Side Planet), and one equipment port in the central office can connect to multiple customers (as illustrated in figure 3.6). This makes the architecture more reliable and cost-effective. Networks utilizing passive optical splitters are often referred to as PON or Passive Optical Networks (Shami *et al*, 2009).

Other flavors of providing broadband Internet have utilized wireless technologies such as WiMAX and Satellite, and also using the second and third generation mobile networks (2G, 3G), and in the very near future the fourth generation mobile networks (4G). However, providing broadband Internet service over copper, coax, or fiber is still dominant since wireless technologies have only been able to work as complementary technologies. This is mainly due to the overall superior performance of wireline technologies and the imperfection in coverage, especially indoor, in wireless technologies.

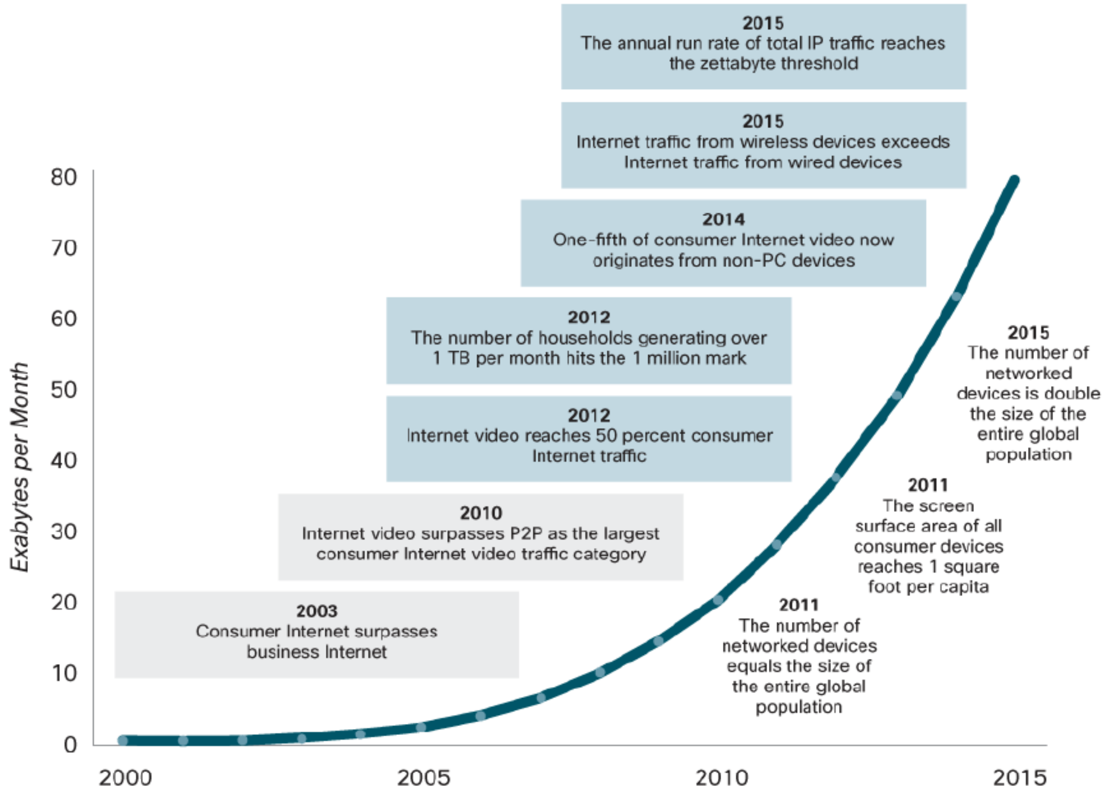
Access Networks end at the central office. Backhauling the traffic to the Internet cloud requires the utilization of data routers and optical transport technologies to connect traffic between operators to route it globally as described earlier.

3.3 Telecom Industry Analysis

The strong emergence of the Internet into the public domain has completely changed the competitive landscape in the telecom industry. The telecom industry started witnessing a massive transformation in the structure and the rules of the game for competition. Services are converging, market barriers are collapsing, products are getting standardized, and companies are merging and building partnerships and alliances.

When a set of alternative products become similar in functionality and usage they turn into commodities. The competition will purely be based on price and companies will fight to get a bigger share of the same limited market space. This is pushing telecom companies into head to head competitions that is eroding profitability for companies and diminishing the attractiveness of the entire industry.

The huge growth in Internet traffic and video-based applications has rendered legacy systems obsolete. Operators have to spend significant capital to keep up with the traffic demand and they face many options in the process (Cisco, 2011). Incremental upgrades reduce the financial burden but could place the company at a competitive disadvantage. Massive transformation of the network might leverage the competitiveness of the company but could also bring a big financial risk if the investment does not pay off. This has become a big dilemma for telcos.

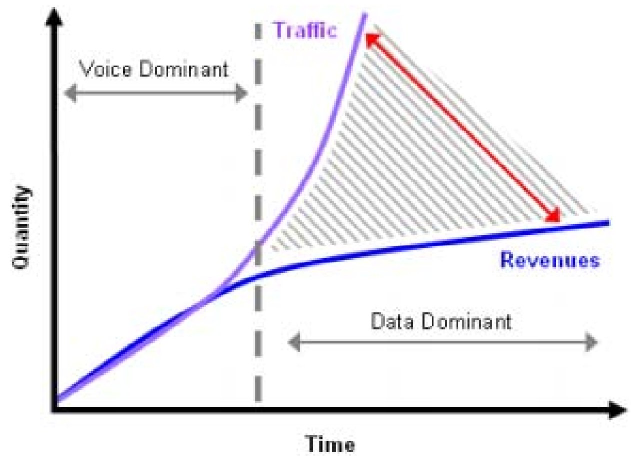


Source: Cisco VNI, 2011

Figure 3.7 Internet Traffic Growth

The challenge that operators face is to try to profit from the investment they make in their network. They continue to spend money on upgrading the network for the same flat rate of Internet connectivity. The challenge is compounded with the trends in the services offered, where operators have to compensate for declining revenues from voice traffic and generate proportional revenues from their investments to keep up with the fast growth in the data traffic.

The trend seen in the Internet growth clearly shows an exponential growth in the Internet traffic for all services. The services that have highest revenue potential growth are mobile broadband, IPTV, and consumer Internet (Cisco VNI, 2010). However, the growth in the IP traffic is not accompanied by a proportional growth in revenues for telcos. As shown in Figure 3.8, the traffic moved from being voice dominant for voice service to become data dominant for Internet services (Donegan, 2007). The traffic started growing at an accelerated rate while the growth rate for revenues was diminishing. There is a gap resulting from the de-coupling of traffic growth and revenue growth. This gap can be labled basically as an uncaptured value by the operators.



Source: Adapted from Donegan, 2007

Figure 3.8 De-coupling of Traffic and Revenue Growth

The discrepancy between the growth in the Internet traffic and the associated revenues has introduced a major challenge for telcos. The operators have to find ways to profit from the exponential growth in the Internet traffic. However, what matters the most is profitability. The profit is a function of revenues and cost in the form of Capital Expenditure (CAPEX) and Operation Expenditure (OPEX).

$$Profitability = f\left(\frac{Revenues}{CAPEX + OPEX}\right)$$

The mission of the telcos is to translate this explosion in the Internet traffic into an opportunity and capitalize on it by providing differentiated services at reduced costs. As shown in figure 3.9, by identifying more revenue-generating opportunities while minimizing cost, telcos will be able to maximize their profitability potential.

Figure 3.9 the Profitability Challenge

3.3.1 Industry Structure

There are many players in the telecom industry. The value chain starts from the semiconductor manufacturers (such as Texas Instruments, Broadcom, etc), who manufacture the semiconductor chips that perform the core functionalities in any telecommunications systems. These chips are sometimes utilized by vendors who manufacture modules and subassemblies, or they can be used directly by the system vendors (such as Alcatel-Lucent, Ericsson, NSN, etc). The operators procure the actual telecommunication network from the system vendors, and use it to run contents from content providers along with other applications and services to the customers (Prario, 2007). The service is usually provided to the customers through retailers, distribution channels, and/or resellers (Peppard *et al*, 2006).

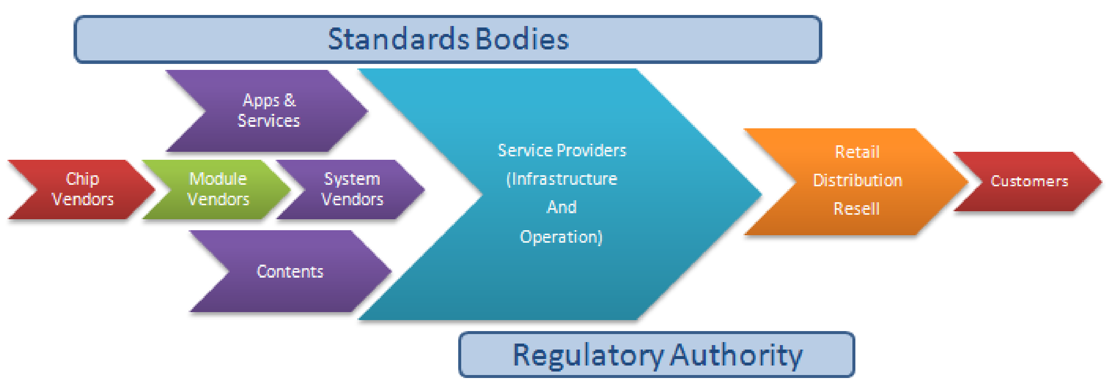


Figure 3.10 The Value Chain in an Operator's Model

Figure 3.10 shows the value chain starting from the semiconductor chips all the way to the delivery of contents, applications, and services to the end user. The chain is governed by two bodies: a technical body for conformance to technical specifications and a legal body for conformance to regulatory and legal mandates.

Since all telecom systems are becoming standards-based, the interface between the different players in the value chain is governed by Standards Bodies. The most dominant Standard Bodies are the International Telecommunications Union (ITU) and the Institute for Electrical and Electronics Engineers (IEEE). Furthermore, the operation of telcos is governed by the Regulatory Authorities, who are government entities founded to promote competition and innovation in the telecom industry.

3.3.2 Telecom Competitive Forces

Fransman (2002) has identified four forces of competition in the telecommunication industry: between products/services, between networks, between technologies, and between firms. He provided examples on each case. The classification of Fransman (2002) is a little too generic and not tailored towards the operators. Additionally, it is not up to date since many things have changed since his analysis in 2002.

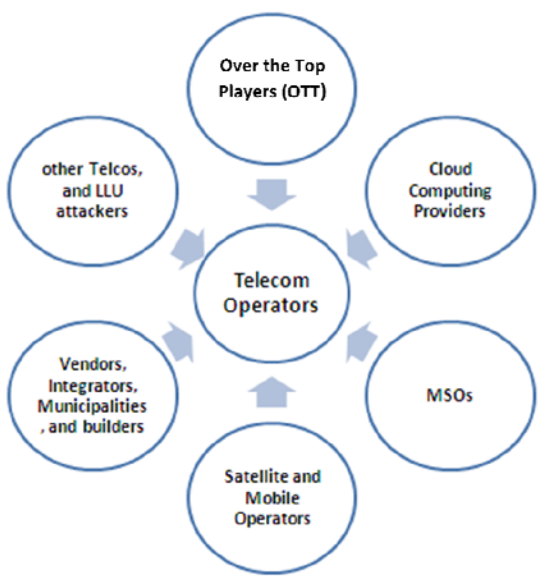


Figure 3.11 Competitive Forces on Telcos

If we label each company providing a telecom service as a telco's competitor, we find that we can identify the competitive forces on the incumbent telco as illustrated in figure 3.11. All these companies are able to provide alternative products/servces. They might have similar networks or they might run their products/services on the incumbent's physical network. They might also use similar technology. So, to distinguish between them we have to see what type of companies they are and identify their core competency.

Other Telcos and LLU Attackers:

These are the traditional telco competitors who operate in the same market with similar network and product offering along with new entrants who are taking advantage of the LLU to offer their service on the incumbent's network

MSOs:

These companies used to provide video service over coaxial cable network, but added later voice and data and upgraded their network with optical fiber to compete more effectively with telcos.

Satellite and Mobile Operators:

These operators provide services either via satellite or using the mobile network. Satellite is still limited and so was the mobile signal prior to the third generation mobile network (3G). Data services over 3G was the first threat to telcos. The fourth generation mobile networks (4G) in the form of LTE (Long Term Evolution) could be a major threat as it can deliver speeds higher than 100Mbps and take significant market share from traditional wireline telcos.

Vendors, System Integrators, Builders, and Municipalities:

These entities work together in certain deployments to provide state-of-the-art solutions in target communities (usually upscale communities). In fact, one of the first FTTH deployments in the US was done by the city of Palo Alto in California working directly with a system vendor to provide the service to its residents (Palo Alto, 2004). Also in February 2010 Google announced its intention to partner with a system vendor and municipalities to provide 1Gbps FTTH service to cities in the US. They will start by offering the service to 50,000 residents in Kansas City in the US (Hardy, 2011). In September 2010, the municipality of Chattanooga announced the availability of the first 1Gbps broadband service in the US for residential and business customers in the entire city of Chattanooga, Tennessee (Epb, 2010). All these are examples of cases when vendors and/or system integrators have worked directly with municipalities and completely bypassed telcos.

Cloud Computing Providers:

Cloud computing providers have been offering a variety of services to both residential and business customers. These services use pooled resources and enable customers to have access to storage, communications, collaborations, and many other applications and utilities. More details on cloud computing will come later in the chapter.

Web Cos/Internet Companies/Over the Top Players (OTT):

These companies started by providing applications, such as search engines and social groups, that did not seem first to compete with telcos. But their business model evolved to include VoIP (Voice over IP), streaming video, and other applications that either cannibalize the telcos' revenues or significantly consume the telcos' resources.

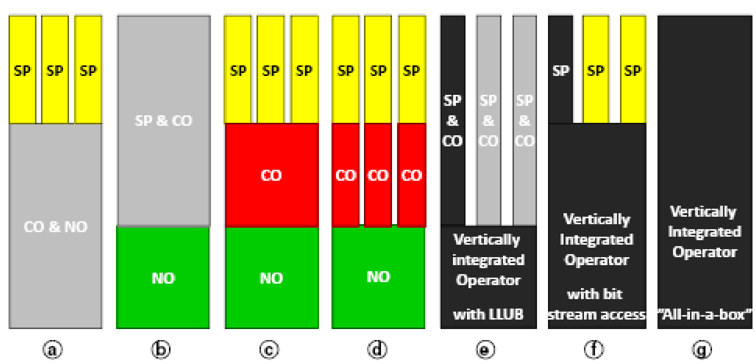
The telecom business environment has become hypercompetitive. Even the telecom value chain is turning into an eco-system where players can bypass the telco to reach to customers directly. It has become extremely critical for incumbent telcos to spot and seize new opportunities as early as possible to identify a strategic growth path. This should be done in a very efficient and effective way in order for the incumbent to defend the core business and have the best competitive position in creating and capturing values.

3.3.3 Competition in the Telecom Industry

The telecom industry received a major setback during the Internet bubble burst, but the foundations of an Internet-based economy were still solid and promising. Many companies disappeared in the recession of 2001-2003, but the new competitive rules were there to stay. Consolidations were inevitable but the competitiveness of the industry continued to intensify. The convergence of services over all-IP networks made it easier for any operator to offer any service. This resulted in a significant collapse for the entry barriers and exposed the operators' networks for attackers. This put telephone companies in direct competition with Cable companies and Satellite companies (Fransman, 2002).

Countries around the globe started forming regulatory authorities to outline the framework for promoting competition in the telecommunication industry. The regulatory authorities first addressed the copper networks by applying infrastructure-sharing regulations to promote higher broadband penetrations and encourage competition. Later, they borrowed many pages from the copper unbundling regulations and enhanced them to be applied in fiber networks (Forzati *et al*, 2010).

Regulatory authorities have applied different models in different countries as shown in figure 3.12. Furthermore, in their efforts to increase competition, they started releasing tenders for Fixed Network licenses and opened the door for foreign operators. Opening the door for competition along with enforcing strict regulatory measures resulted in the creation of different operating models (Forzati *et al*, 2010). This resulted in an intensive competitive pressure on incumbents even in their traditional model. The new entrants were compelled by the regulatory rules to benefit from existing infrastructure for a predetermined fee. Building a telecom infrastructure was long considered as a major entry barrier in the telecom industry due to the high cost and the long time it takes to get a network operational. However, the deregulation rules made the industry friendly to new entrants and put a burden on the incumbent to defend their territories and justify making new investments knowing that attackers would have an easy access to these investments.



Source: Forzati *et al*, 2010

Figure 3.12 Network Unbundling Scenarios

By reviewing the models in figure 3.12, we can say that the operator's network can be divided into three sections: service, communications, and network or infrastructure. Operators, historically, were vertically integrated and they had full control over all three sections (case g). By enforcing the Local Loop Unbundling (LLU) by regulatory authorities, other models became possible. The operator can still own the network and communications and compete, through bitstream, with other telcos on the service (case f). Another possibility is for the operator to only own the network section and compete with other operators on the communication and service sections in an unbundled network (case e).

Other scenarios include the operators sticking to their core competency by providing the communication and network infrastructure to other telcos (case a). Alternatively the operator can just own the network infrastructure and provide it to one or multiple communication operators and telcos in all possible mixes (cases b, c, and d).

The different unbundling models illustrate the number of players who have entered the industry seeking to provide services and solutions to customers at lower cost and with more innovative features than what the incumbents offer. This introduced a tremendous amount of pressure on the incumbents to upgrade their product offering and to be more efficient to provide more competitive pricing so they can keep up with the ever-increasing competitive pressure.

Outside the traditional competition with other Telcos or MSOs, a non-conventional competition started looming with OTT companies and indirectly with device manufacturers who utilized the Telcos' network to stream their bandwidth-consuming traffic to completely jam the Telcos' network without providing them their fair share of revenues. Companies, such as Google and Apple, have not only started competing on the wallet-share of the Telcos' customers, but they have also started to directly attack the business model of the Telcos with free or pay-per-usage alternative services. The telecom comsumers' spending increased but telcos did not benefit and their revenues remained flat.

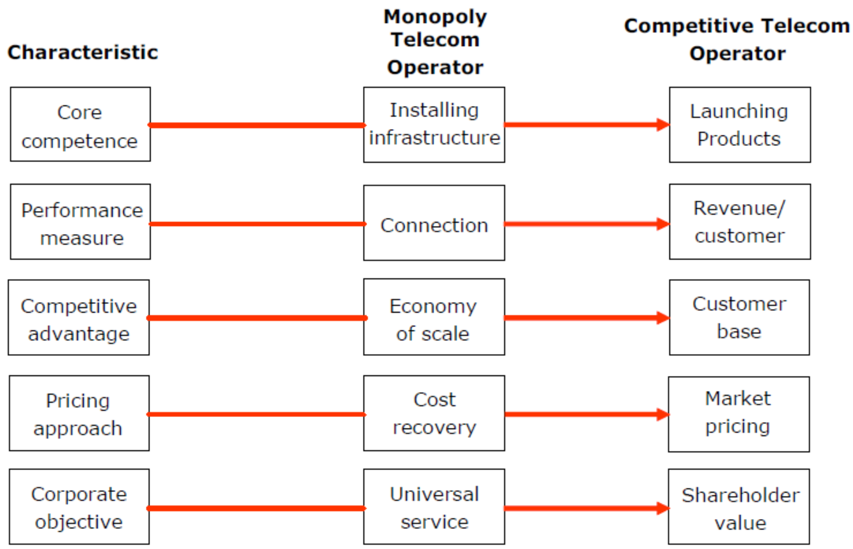
As people started relying more on the iPhone to access media contents, the AT&T wireless network was crushed with an unexpected data tsunami from the iPhone users (Wortham, 2009). This created a public relationship crisis for AT&T and produced many unhappy customers especially in the cities of New York and San Francisco where the problem was most severe. To resolve the issue, AT&T had to spend $18 billion dollars to upgrade their network in 2009 (AT&T, 2009) (Wortham, 2009).

Source: Google, 2011a

Figure 3.13 Comparison between the stock performance of Apple and AT&T since the launch of the iPhone in June 2007

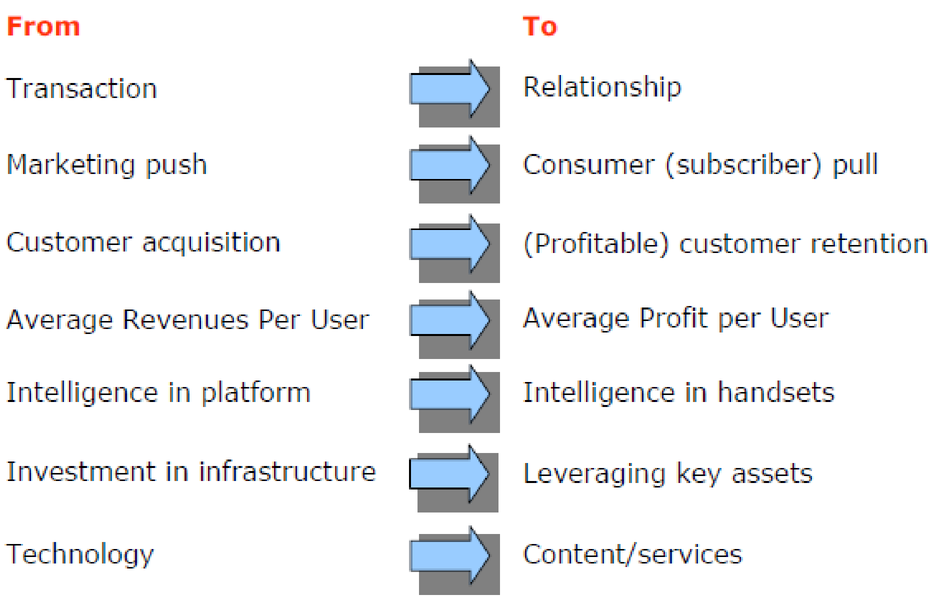
The iPhone case shows a great example of a very innovative product introduced by two companies, but the value created was mostly captured by the phone maker which left the operator with additional revenues but little profit. As the stock performance shows, in figure 3.13, since the introduction of the first iPhone, the stock price of Apple soared by almost 230%, while the performance of the AT&T stock price during the same period was almost flat at about 8%.

Based on the mentioned changes, we find that the operators face many challenges as they transition from being monopoly telcos to being competitive telcos. The characteristics for some of these challenges are shown in figure 3.14. As seen in the figure and outlined by Peppard and Rylander (2006), operators have now to focus on launching products at competitive pricing and generate revenues from wide customer base. This enables them to maximize their shareholders' value.



Source: Peppard and Rylander, 2006

Figure 3.14 Challenges of Operators as they Transition to be Competitive



Source: Peppard and Rylander, 2006

Figure 3.15 Shift in the Focus of Telcos

Peppard and Rylander (2006) went a step further and outlined the shift in the focus of the telco (shown in figure 3.15). The focus should be on building relationship with customers and retain customers by listening to and addressing their needs. At the same time, what more important than revenues is the actual profit. Therefore, the cost has to be kept under control to maximize the profit per user. Furthermore, the network and terminals have to be intelligent and capable of delivering differentiated content and services. Finally, telcos have to leverage their key assets as a source for a sustainable competitive advantage.

3.4 Telecom Industry Trends

As discussed previously, the telecom industry went through massive transformation over the last two decades in terms of the evolution of the technology, market, and the competitive forces in the industry. In order for any company to craft the right strategy to have the best possible competitive position, they have to first fully understand the industry trends. This is not an easy task especially when we consider how dynamic the industry has been and how vast the changes in technology are which have been stimulated with the strong emergence of many new innovative products.

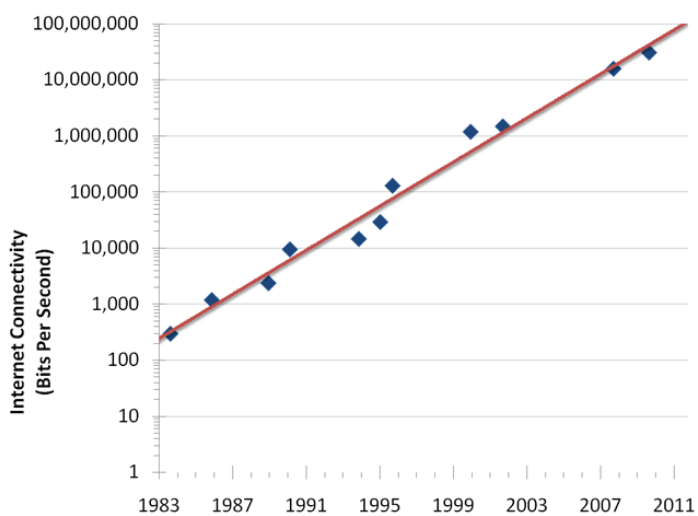
Innovations in the telecom industry are driving what can be described as “Creative Destruction” within the telecom industry. The creative destruction concept was first suggested by Joseph Schumpeter (1942) in reference to the process of industrial mutation where there is a continuos evolution that revolutionizes the economic structure from within and destroys the structure while a new one is created (Shumpeter, 1942: 82-85). The concept seems very applicable within the telecom industry. Therefore, it is critical for telecom leaders to recognize the trends in the telecom industry to predict how the industry will evolve so their company can have the most competitive position.

The major trends in the telecom industry will be reviewed to highlight some of the potential opportunities and/or threats for telcos. These trends rely on historical data and status of technologies along with the directions by the lead players in the industry.

3.4.1 Growth in Demanded Bandwidth

With all the uncertainties in the trends and the predictions of the telecom industry, the one thing that held true for more than a decade is the growth of the Internet traffic at a compounded annual growth rate (CAGR) of 40-50%. The rate has been well in line with a prediction made by Jakob Neilson back on 1998, which states that the high-end user's connection speed grows by 50% per year (Neilson, 1998). This became Neilson's law and the empirical data shows that the law has been accurate from 1998 until our current date as shown in figure 3.16.

Neilson's law is similar to the more established Moore's law which predicts an annual growth rate of 60% for the computer power. Moore's law is focused on processing power for the chips which are also used at the network terminals in telecommunication networks. While Neilson's law is more on the actual connection broadband speed provided, which could be a factor of the network capability and market readiness for that speed. By comparing the two laws, we realize that the connection speed will remain to be the main bottleneck in the quality of experience of using the Internet.



Source: Neilson, 1998

Figure 3.16 Empirical data showing connection speed since 1984

Catering for the future growth in Internet traffic is the main engine behind innovations in technology, products, and any initiative by operators to upgrade their networks. Therefore, it became a very important task for technology leaders in the telecom industry to predict the traffic growth and position their company accordingly. The task is focused on analyzing the factors that fuel any future growth in the Internet bandwidth and it extends to even break down the predicted growth by service (such as voice, video, data) and by user (consumer, business, mobile).

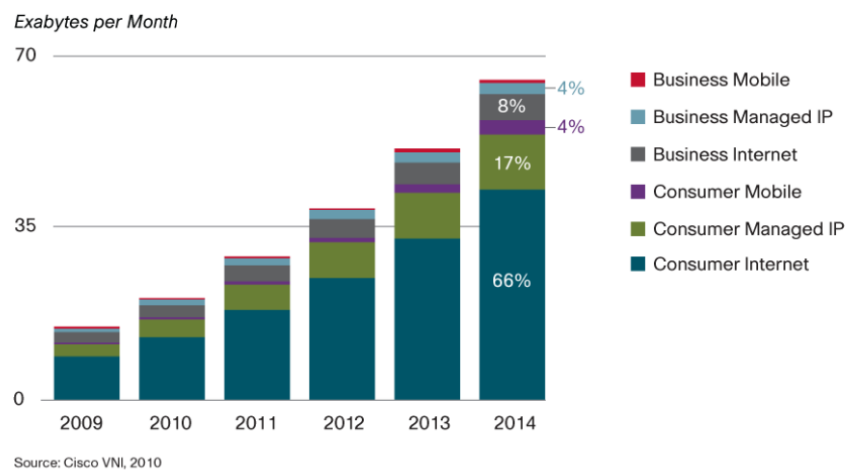


Figure 3.17 Trends in Internet Traffic Growth 2009-2014

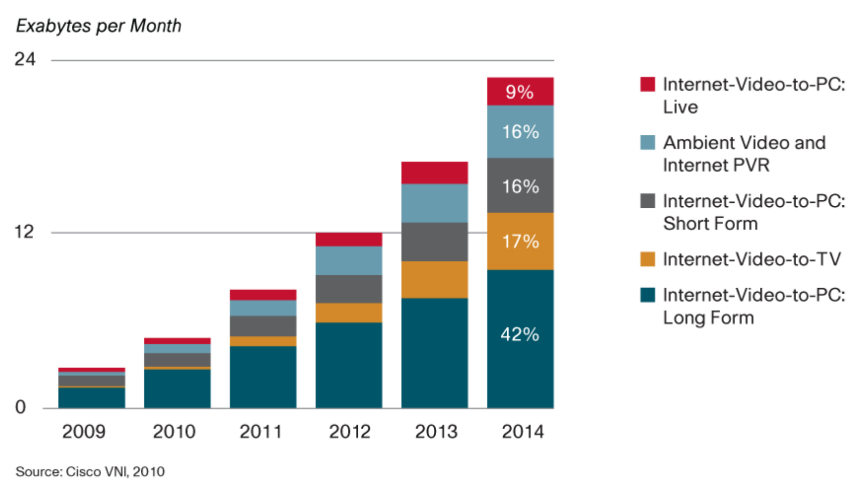


Figure 3.18 Trends in Video Traffic Growth 2009-2014

One of the most referenced indicators for the bandwidth growth is the Cisco Visual Networking Index (Cisco VNI, 2010), which is revised periodically to track and forecast the impact of visual networking applications. In their June 2010 report for the period of 2009-2014, the following trends were highlighted:

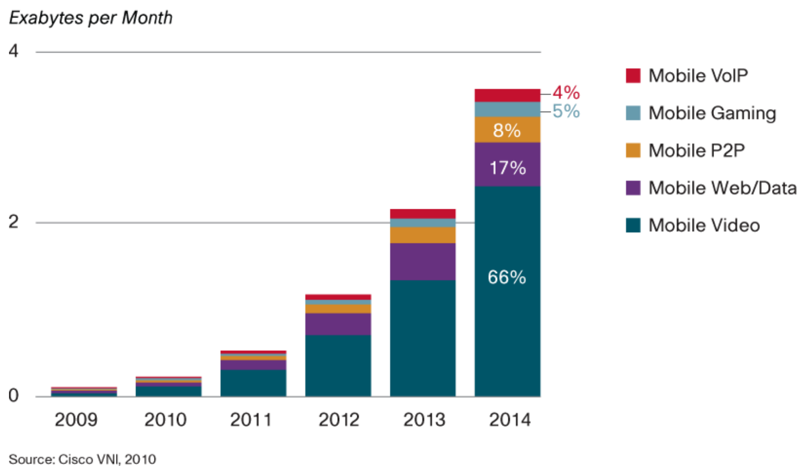


Figure 3.19 Trends in Mobile Traffic Growth 2009-2014

- Annual global IP traffic will exceed three quarters of a Zettabyte (767 Exabyte) in four years
- Global IP traffic will quadruple from 2009 to 2014 (figure 3.17)
- Global Internet video traffic will surpass global peer-to-peer (P2P) traffic by end of 2010
- Advanced Internet video (3D and HD) will increase 23 folds and video will consume 91% of the overall consumer traffic by 2014 (figure 3.18). 3DTV on a PC might gain huge momentum since it only requires software decoder and no other purchases or subscriptions are required beyond what is already paid for PC Internet access.
- Mobile data traffic will double every year through 2014, increasing 39 times between 2009 and 2014, and 66% of the traffic will be video by 2014 (figure 3.19)
- Hyper-connectivity has emerged as an important dynamic that has the potential to greatly increase traffic

One thing worth noting is that even though Cisco has been thoroughly studying growth in data traffic, they actually had to adjust their predictions on almost annual basis. New trends, applications, user behaviors, and technologies are emerging every year and are having a big impact on the generated traffic.

3.4.2 Collapse of Market Barriers

One of the major drivers for the increased competition in the telecom industry is the collapse of the market entry barriers which invited new competition to emerge. It was mentioned earlier how the globalization and the deregulation in the telecom industry have removed barriers of competition and the deregulation of the industry intensified the competition with many new entrants (Gao, 2011; Gruber and Verboven, 2001). Opening the network through unbundling was explained earlier in the chapter. It was an attractive option for companies to compete without having to invest in building a new network by using one of the options described by Forzati *et al* (2010).

To further promote competition in pursuit of picking the best possible operator, regulators started issuing licenses and opening the door for domestic and international bidders (Gruber, 2007). The process started first with licenses for mobile networks and extended later in many countries to even include licenses for fixed networks (Curwen and Whalley, 2006).

Operators like Vodafone, France Telecom, TeliaSonera, and Telefonica have been aggressively pursuing such licenses as they seek revenue growth opportunities beyond their saturated local markets (Curwen and Whalley, 2006). The geographical presence of some of the lead global mobile operators is shown in table 3.2. Acquiring an international license and competing outside the home market was an attractive proposition for these companies to boost their revenues and increase their customer base to benefit from the economies of scale.

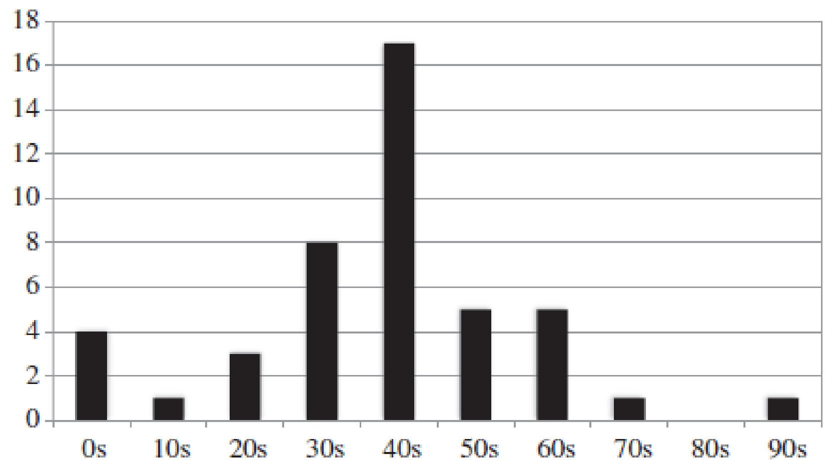
This was a major change for incumbents who have enjoyed a monopolistic position and a local government backing for a long time. The incumbents had to adjust to the fact that they are no longer protected by their geographical local presence. As seen in figure 3.20, the market share of the incumbent has been adversely impacted by the process of liberating the telecom industry where significant percentage of the incumbent operators saw their market share drops to less than 50% (Whalley and Curwen, 2011).

Company	Number of countries	Number of countries by region						
		Western Europe[a]	Eastern Europe[b]	Middle East[c]	Asia[d]	Central and South America[e]	North America[f]	Africa
Vodafone[g]	32	16	2	—	6	—	1	7
France Télécom[h]	27	11	2	1	1	2	—	10
Telefónica[i]	25	2	1	—	4	14	—	4
MTC (incl. Celtel)	18	—	—	4	—	—	—	14
TeliaSonera	17	7	3	4	2	—	—	1
Millicom International	16	—	—	—	4	5	—	7
Hutchison Whampoa	15	6	—	1	7	—	—	1
Telenor	15	5	3	—	7	—	—	—
Tele2[j]	15	13	2	—	—	—	—	—
América Móvil	14	—	—	—	—	13	1	—
Deutsche Telekom[k]	14	8	4	—	—	—	1	1
Orascom	14	—	—	2	7	—	—	5
Etisalat	11	—	—	3	—	—	—	8
MTN	10	—	—	—	—	—	—	10
TDC	10	9	—	1	—	—	—	—
Investcom	8	1	—	2	—	—	—	5
Portugal Telecom	8	1	—	—	2	1	—	4
Telekom Malaysia	8	—	—	—	6	—	—	2
NTT	7	—	—	—	7	—	—	—
OTE	7	1	5	1	—	—	—	—
Singapore Telecom	7	—	—	—	7	—	—	—
Sprint Nextel	7	—	—	—	—	5	2	—
Telecom Italia	7	1	—	1	—	5	—	—
Turkcell Holding	7	—	2	4	1	—	—	—
Mobile TeleSystems	6	—	3	—	3	—	—	—
Alltel	5	2	—	—	—	2	1	—
Telekom Austria	5	3	2	—	—	—	—	—
Verizon Comms	5	1	—	—	—	2	2	—
Vivendi Universal[l]	5	1	—	—	—	—	—	4
Vodacom	5	—	—	—	—	—	—	5
O_2	4	4	—	—	—	—	—	—
VimpelCom	4	—	2	—	2	—	—	—
KPN	3	3	—	—	—	—	—	—
SK Telecom	3	—	—	—	3	—	—	—
Total	364	95	31	24	69	49	8	88

Source: Curwen and Whalley, 2006: p. 668

Table 3.2 Geographical Presence of Global Mobile Operators

A specific example on the declining market share of incumbent operators is shown in figure 3.21. MTS has seen its market share drop from more than 90% to less than 40%, while Vodafone has droped almost from 60% to 20% (Whalley and Curwen, 2011). These two companies have been very active in acquiring international licenses. Therefore, the international expansion was also a defensive strategy to compensate for the lost revenues and declining revenues in the home market.



Source: Whalley and Curwen, 2011: p. 9

Figure 3.20 Distribution of Incumbent Operators and their Market Share

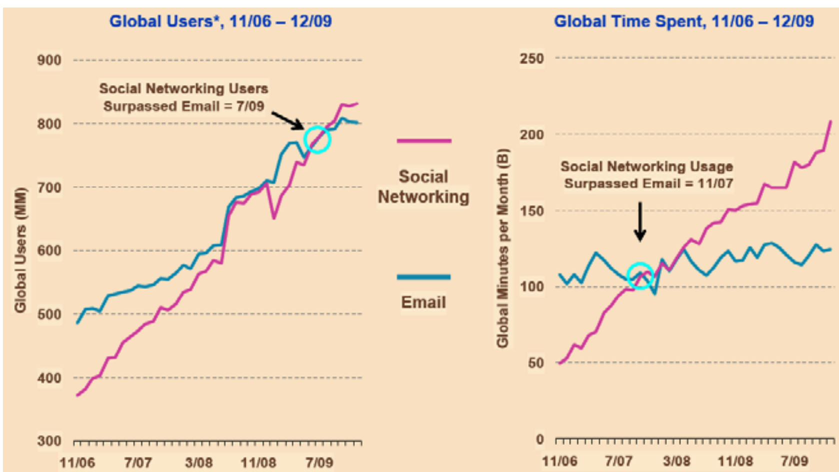
Source: Whalley and Curwen, 2011: p. 9

Figure 3.21 Example of Declining Market Share for Incumbents

The proliferation of the Internet has also facilitated the process of lowering the entry barriers to different industries (Fransman, 2002; Porter, 2008). One emerging trend in the telecom industry that might have severe impact on telcos is the emergence of OTT players. These companies provide applications and services that they stream over the Internet connection directly to the end customers. The setup cost for these companies is low and they do not have to make significant infrastructure investment to start targeting customers (Osterwalder and Pigneur, 2010).

3.4.3 Interactivity, Personalization, and Sharing

During the early days of the Internet most websites were static pages that people can go through the same way they would go through a newspaper. Many things have changed since then as websites got more advanced and became rich in multimedia contents. This evolved to cater to consumers' needs to have more interactive and personalized services and to be able to share contents with social groups.



Source: Morgan Stanley, 2010, p. 37

Figure 3.22 Comparisons between Social Networking and Email

Social networking groups have been great phenomena, and they are expected to continue to evolve. As shown in figure 3.22, there are more social networking users than email users, and people spend more time now on social networking sites than they do on emails.

One of the leading companies in social networking is Facebook, which has over 800 million active users and is reported to be the most visited site on the Internet. Facebook reports that every month people spend over 700 billion minutes on their website they share over 30 billion objects (contents, photos, videos, etc) (Morgan Stanley, 2010). These are some of the amazing statistics that the company was able to achieve within 5 years of its existence and it shows the power of social networking groups and the power of the Internet in general.

Another trend along that same line is in the way the video service is presented to customers. Although the majority of TV minutes are still on broadcast networks, the behavior is changing from broadcast to unicast where each user gets his/her own unique video stream. Video on Demand (VoD) is expected to double every two and a half years through 2014 and applications are migrating from off-line to on-line with gaming leading the way in gaming-on-demand and streaming gaming platforms (Cisco, 2010).

Some of the unknowns will be the impact of new revolutionary products, such as Google TV and Apple TV. Both platforms address providing video contents to users in a more interactive and personalized way than traditional video delivery methods. However, since these products are new, their impact is still unknown. Telcos, however, should be prepared to face these disruptive technologies with similar innovations.

3.4.4 Convergence of Networks and Services

Network convergence refers to moving from supporting services on different fragmented networks to leveraging the new deployed network to converge all services on the same network.

The existing fragmented nature of the operator network is mainly due to the historical evolution in telecommunications where each service has a unique characteristics and different requirements. However, as all services are becoming IP-based, there is a great opportunity for operators to maximize their investment and lower their overall cost of ownership by converging all services on new networks.

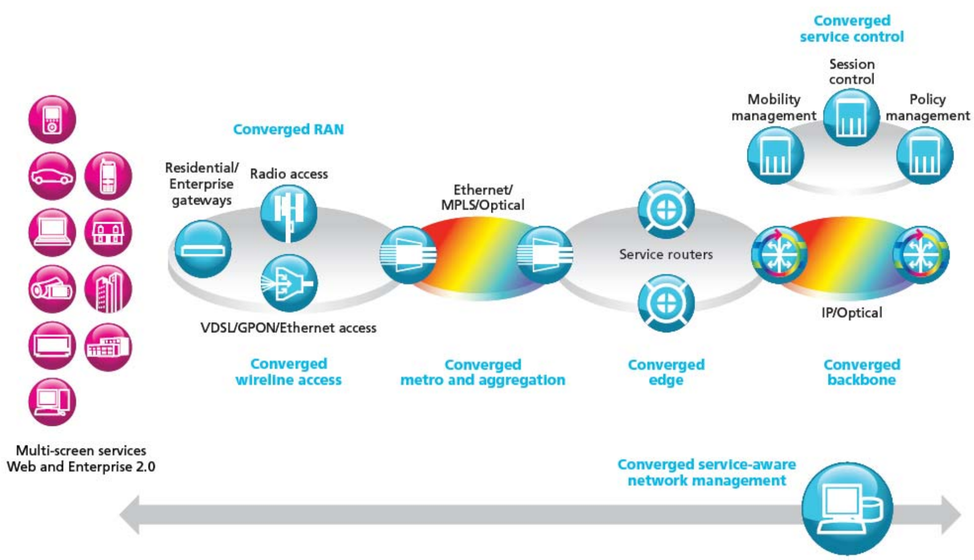
There are several trends in convergence as they relate to the different segments of the network. Some of these trends are:

Single Access Platform:

The new Access platforms which rely on driving fiber deep in the network are capable of supporting all services for all types of customers on the same platform. Voice, video, and data services can be provided to both business and residential customers. This is especially true for Fiber to the Home (FTTH) platform which has a huge bandwidth that can support all services even the mobile back-hauling.

All-IP Networks:

All-IP Networks converge the backhauling of voice, video, and data traffic to get them routed on the same core network. Each service will be virtually separate but will run on the same physical network. This also includes what came to be known as Fixed Mobile Convergence (FMC), where both fixed and mobile networks have the same core to backhaul their traffic.



Source: Alcatel-Lucent, 2010a

Figure 3.23 Converged Telecom Network

IP-Optical Convergence

IP and Optical layers have historically been separate layers and managed by separate boxes. The IP traffic is handled by IP routers which provide all the intelligence to route traffic from a source to a destination. The optical layer, on the hand, ensures a reliable transmission of the traffic. When IP and Optical layers are converged, one box will be intelligent enough to know whether an optical wavelength needs to be terminated and converted into an electrical IP signal, or if it will just need to be forwarded to another node. This has significant implication on the performance and the cost as it reduces the number of ports required from IP routers.

An example of a converged telecom network is shown in figure 3.23 (Alcatel-Lucent, 2010a). The network is converged at the Access, Metro, and Core. At the same time, the management system is converged which helps provide an end-to-end view of the network.

3.4.5 Centralization and Virtualization

Cloud computing is a new trend for both telecommunications and IT technologies. It is basically a flexible and scalable online computing environment that encompasses service-centric solutions to provide cost-effective, on-demand network access to computing power and storage. It attempts to simplify the network and peripherals at the customer ends while putting all the complexity and the intelligence (networks, storage, servers, applications, and services) in the "cloud" (Alcatel-Lucent, 2010b). Cloud computing has five characteristics (Kundra, 2011): on-demand service, broad network access, resource pooling, rapid elasticity, and measured service.

Cloud computing provides on-demand and self service provisioning of computing resources and access to pooled resources. Since these solutions are in a highly aggregated and shared pool of resources, accessing them can be done faster and with lower administrative and management costs and efforts. At the same time, it offers much higher scalability and flexibility in terms of upgrades and expansions (Hall, 2010).

There are several flavors to cloud computing, the most dominant ones are (Kundra, 2011):

Infrastructure as a Service (IaaS):

IaaS provides processing, operating system, storage, networking, and related computing resources which allow users to deploy any applications software they wish to use. IaaS enables operators to build a bridge between enterprise network services and enterprise IT infrastructure.

Platform as a Service (PaaS):

PaaS provides an online development environment by offering computing resources and development tools in the cloud.

Software as a Service (SaaS):

SaaS enables users to use applications running on a cloud infrastructure. These applications are accessible from multiple devices. SaaS is the most mature aspect of cloud computing. Many popular applications use SaaS, such as: Customer Relationship Management (CRM), communications and collaboration applications (like video conferencing), and many other industry-specific applications.

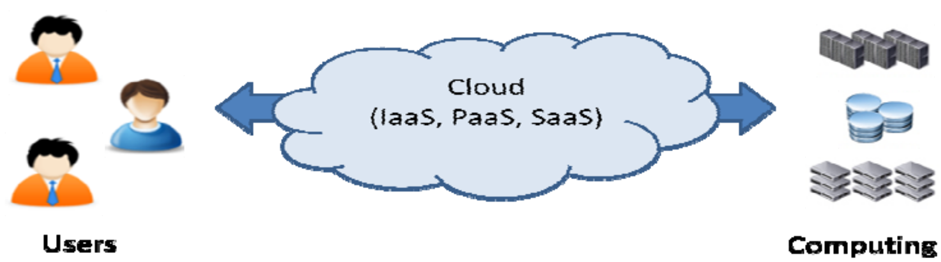


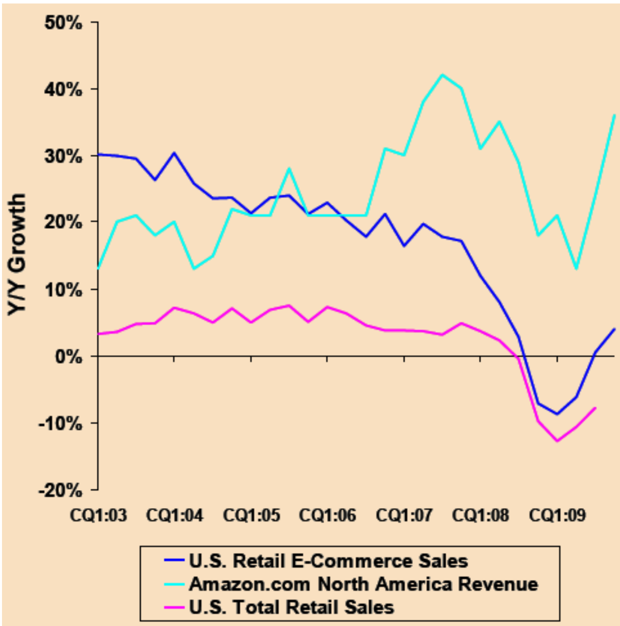
Figure 3.24 Cloud Computing Concept

A simple diagram that illustrate the concept of cloud computing is shown in figure 3.24. This concept started in the IT industry where an IT company will run the cloud to offer different services to their clients such as storage, communications, and collaboration.

New cloud computing operators started to emerge to focus primarily on offering cloud services which forced the incumbent telcos to seriously consider offering this kind of services themselves to fend off the new competition. In this effort, the operators try to bring enterprise-grade solutions to a broader base of users. This will be a nice extension to the managed services they already provide and it enables them to provide their product offering which can be backed by a strong end-to-end service level agreement (SLA).

3.4.6 Online Advertising and Online Commerce

As people started embracing the Internet usage in the late 1990s, many dot.com companies have emerged to promote e-commerce as a faster, cheaper, and more convenient outlet to sell merchandises. A lot of hype was created and the stock market got way ahead of itself until the Internet bubble burst in 2001. Afterwards, many of the dot.com companies disappeared but others survived and over time proved to have a solid business model. In fact, when we look at the current status of online advertising and online commerce we find that it is having a very healthy growth in comparison to the traditional sales generated from stores and outlets.



Source: Morgan Stanley, 2010, p. 33

Figure 3.25 Comparison between Amazon.com and US Retail E-commerce Sales

Figure 3.25 shows a comparison in the year over year (Y/Y) growth of the U.S. total retail sales, the US retail e-commerce sales, and the revenues of Amazon.com (Morgan Stanly, 2010). As shown in the figure, e-commerce sales have enjoyed much healthier growth than the total retail sales. This is mainly due to either having increasing number of companies to sell exclusively over the Internet to lower their cost of operations, or in companies having their Internet sales channel parallel to their network of stores and outlets.

Online e-commerce has been the focus of many companies that have enjoyed a very healthy growth such as: Google, eBay, Amazon, and Apple. Through the utilization of sponsored advertisement and providing free applications and utilities while getting paid from advertisers enabled these companies to be extremely successful. This enabled companies like Apple to get paid for every application that gets downloaded from their Application Store, and enabled Google to get paid for every click on a sponsored advertisement.

After a little over ten years of its introduction, it seems that online commerce and online advertising are finally entering their golden age. Companies taking advantage of this trend have become highly profitable and have taken a significant wallet share from the telcos' customers.

3.5 Summary

The tremendous changes in the technical, regulatory, and competitive forces represent a paradigm shift in the environment where telcos operate. This chapter has presented the historical, regulatory, and technical background of the telecom industry. The background information was needed as a foundation to describe the existing structure of the industry with all the competing forces and value chain. We have found that telcos, who many used to be pure monopolies, now face significant competitive pressure. Some of the pressure comes from unconventional competitors like the OTT companies and the cloud telcos. These companies are very innovative and have low cost structure that enable them to impose a significant challenge on the incumbent telco. We also found that deregulation in the industry has created several models for unbundling to separate the operation of the traditional incumbent into services, communications, and infrastructure.

The chapter further discussed the challenge of operators in terms of their inability to create and capture value. In order for the operators to be in a better position to create and capture future values, they have to identify opportunities in the industry and monitor the trends in the industry and the technology.

Telcos should prepare for the continous exponential growth in demanded bandwidth and should prepare their network accordingly. However, the proliferation of the Internet combined with the deregulation in the telecom industry has significantly lowered the entry barriers. Therefore, incumbent operators should prepare for this competition by providing personalized and interactive services and benefit from the boom in online advertising and online commerce. Operators need to take advantage of the convergence trends across the network to minimize their cost structure. Another trend in the industry that can help operators minimize cost and deliver higher value to customers is cloud computing and cloud-based services.

There are many challenges for the operators and many initiatives that have to be undertaken to respond more effectively to the increasing competition and to be positioned more competitively. There are also many tradeoffs involved, but telcos first need to understand the transformation in the technology and the industry before they formulate the right strategy and business model.

Chapter 4

The Strategic Business Model for Future Telcos

4.1 Introduction

The previous chapter went through the historical, regulatory, and technical background of the telecom industry. It also outlined the current status of the industry and the trends that are being witnessed. These tremendous changes in the technical, regulatory, and competitive forces represent a paradigm shift in the environment where telcos operate.

In order for telcos to be successful and continue to deliver the maximum value to their shareholders they have to adapt to the transformation in their industry. This adaptation will not be easy and will require a re-invention of the business model that telcos used for years. There will be many trade-offs and difficult choices that need to be made. The main problem that telcos will face is that they have many initiatives that they need to pursue with limited budget. Each trend mentioned in chapter 3 can be a real dilemma to telcos since it could turn into a threat or an opportunity.

This chapter researches the current competitive status of the telecom industry as seen by experts in the industry. The research work will rely on the outcome of a research survey as an effective way to understand the trade-offs and the priorities of telcos in the different strategic areas. The research study will identify the strengths, weaknesses, threats, and opportunities for telcos in the industry. It will also highlight the best response that telcos can have to the changes in the competitive landscape, and how they can capitalize on the trends in the industry to turn them into growth opportunities. The outcome of the survey can serve as the strategy foundation for telcos to create a new business model. The new business model will keep in mind the new competitive landscape outlined in 3.5 and the industry trends highlighted in 3.6. The ultimate goal is to strengthen the telcos' competitive position as they respond to the changes and trends in the telecom industry.

4.2 Motivation and Research Framework

Most telcos still run old an outdated network that needs a major upgrade to keep up with the new demands and the emerging services and applications, some of which were listed in 3.6. An illustration of an end to end network is shown in figure 4.1. Applications and contents provided over the network continue to consume larger bandwidth. When operators start to provide IPTV, the core has to be upgraded from TDM (Time Division Multiplexed) Network to an all-IP network in order for the operators to have a scalable and efficient utilization of the network resources. Access network also has to be migrated from copper to fiber to be able to have a platform that can support future applications and avoid the bandwidth limitations that are inherent in copper networks.

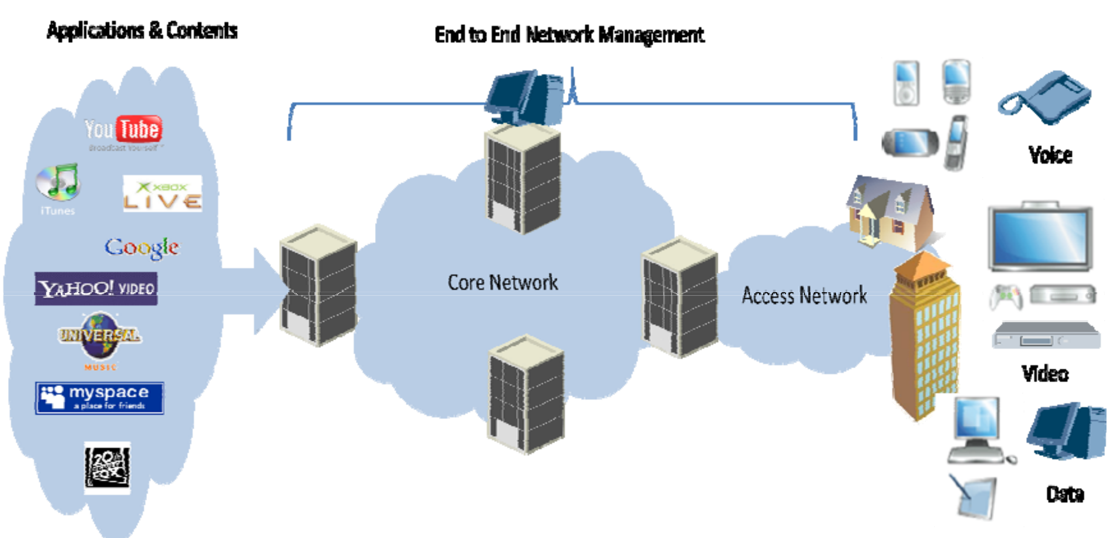


Figure 4.1 General Illustration of a Telco's Network

Telcos have to continue to identify new revenue opportunities to avoid having to carry the burden of continuously upgrading the network for a flat Internet access monthly fee. The revenue opportunities will have to come from new contents and applications introduced to customers. Telcos also need to guarantee the performance of the new services in terms of monitoring QoS (Quality of Service) and QoE (Quality of Experience) through NMS (Network Management System). The end-to-end monitoring capabilities enable the operators to improve the service level provided to customers, and it also enables them to quickly isolate and mitigate problems before they become service affecting. This all translates into savings in the operating cost and improved customer satisfaction.

By upgrading the entire end-to-end network, telcos can make sure that they are ready for all the services and applications that are expected to generate a “data tsunami”. However, this might still not be good enough as the business model will have to change as well. Telcos no longer have a monopolistic position or compete with only traditional competitors. The contents and applications that run through the networks can be licensed and provided by the operaters themselves, but if they are provided by OTT through the Internet connectivity, the operator will have no control over it.

The telecom network is terminated at the customer premise which has the home network. The home network is basically the interconnected customer devices that cater to the different applications and services provided over the telecom network. Operators have been trying to get inside the home network and provide intelligent solutions to customers like smart home solutions and building management solutions. These solutions are still too expensive for most people who still do not see the value of paying premium for such services.

When discussing the competitive status of the telecom industry it was found that the competition was represented by companies that either compete head-to-head with the telcos or provide services that adversely affect telecom companies. The survey will be around the challenges and opportunities for telcos given the status of the competition in the industry and all the emerging technologies and the different priorities and tradeoffs that telcos are facing.

4.3 Researching the Telcos' Challenges and Opportunities

4.3.1 Survey Methodology

The survey was intended to collect the views of experts in the industry which could be used in formulating a strategy for telcos. It was designed to focus on the main issues that telecom customers are facing today along with some of the opportunities that are emerging with these customers. The survey questions and options were driven by the analysis presented in chapter 3 for the competitive status for telcos and the trends in the telecom industry.

To formulate a strategy we need to identify the major external factors in the industry that can turn into either opportunities or threats for a telco. We also need to indentify the main internal factors that might present themselves as either strengths or weaknesses and would place the incumbent operator at a competitive advantage or disadvantage.

By analyzing the drivers from the customers along with the internal and external factors, telcos can determine their competitive position and decide where they need to focus their investments. The network will need to be upgraded to support the new competitive initiatives, and investments need to be made in services that have the highest potential for revenues. To further strengthen the competitive position, collaborations and alliances with credible business partners are inevitable. Therefore, and based on the selected initiative, telcos need to identify the most valuable partner that enable them to achieve the best possible competitive position. A chart for the described strategy formulation process is shown in figure 4.2.

The survey was meant to be focused and not take a significant time to complete in order to maximize participation. Therefore, the survey was limited to 13 questions, 3 of them were on the demographics of participants. Experts from across the telecom value chain were invited to participate to cover: chip manufacturers, systems vendors, telcos, and others (e.g. education, consultants, content provider, app developers, etc). Participants also represented wide geographical area covering North America, Europe, Asia, and the Emerging Markets. This provided global perspectives on the expected survey responses. Finally, the survey asked about the position of participants relative to the chain of command in their organization.

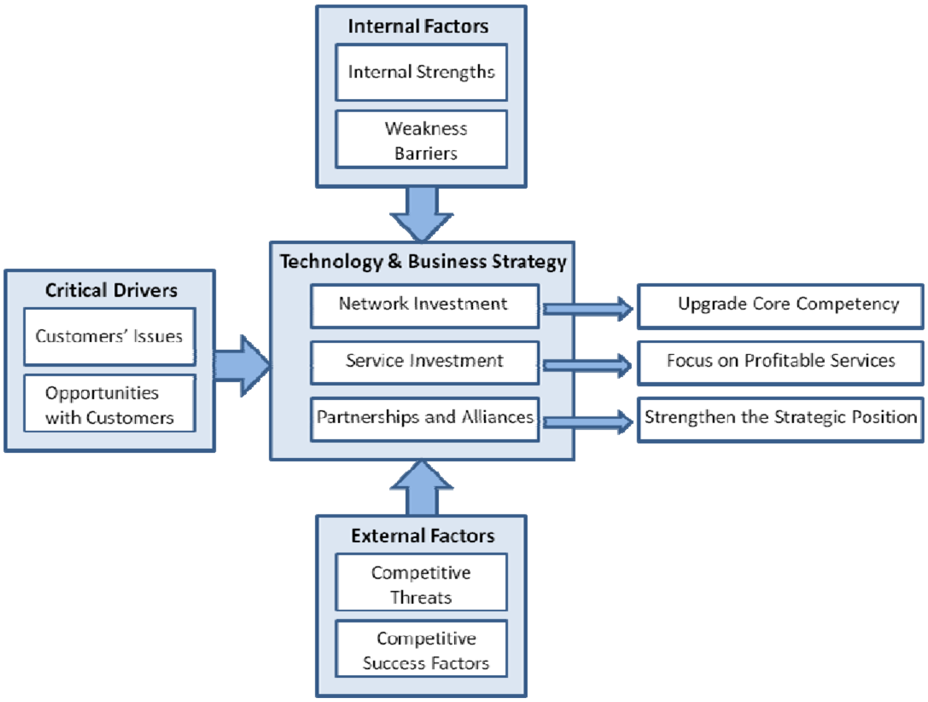


Figure 4.2 Chart for the Strategy Formulation for Telcos

The survey (full data are in appendix I) was sent to approximately 500 telecom professionals, and the goal was to have at least 20% participation or about 100 participants. Multiple choice questions were selected to keep the responses focused. Since there were no right or wrong answers and it was all about trade-offs and prioritizing to find the best overall competitive position, rating scale questions were utilized. Participants also had the option to add comments as needed. The survey was run over 4 weeks between February and March 2011. It was closed when there were enough samples in every population subset and when there was no observed deviation in the survey outcome as a result of additional samples.

The decision to conduct the survey was meant to reach the maximum number of people to cover also the world's main geographical regions. The survey was conducted using the Pro version of Survey Monkey (www.surveymonkey.com, copyright 1999-2011). After the data was collected, it was analyzed using SAS software V9.2 (2008, Cary, NC. SAS Institute Inc). SAS is a software tool where users can perform statistical analysis on data stored in tables, and look for trends and correlations in the data. The SAS software is very commonly used in business planning, forecasting, and decision support.

The SurveyMonkey online software was used to generate the survey questions, broadcasting the survey to the target participants, and collect the responses. The software allows browsing individual responses to each survey question, filtering responses, cross-tabulating responses, and downloading the responses for more advanced analysis.

The downloaded data was fed to the SAS software to determine the correlation between the different answers of the survey. Correlation is a technique for investigating the relationship between two variables (Rodgers and Nicewander, 1988). The Pearson's Correlation Coefficient is used in the SAS software to help measure the strength of the association between the two variables (Rodgers and Nicewander, 1988). The t-test is used to establish if the correlation coefficient is significantly different from zero and that there was a strong association between the two variables.

Crosstabulation is a joint frequency distribution of cases based on two or more categorical variables (Michael, 2011). In the SurveyMonkey software, the crosstabulation shows a comparison of two or more survey questions to determine how they are interrelated. The 2-sample t-test, which is used in crosstabulation, looks to see if two means are significantly different from each other. To determine the significance level, the p-value approach was used (Berenson *et al*, 2002).

The p-value is widely used especially with the increased popularity of statistical and spreadsheet software. The p-value, which is also referred to as the observed level of significance, tests for the smallest level at which the null hypothesis can be rejected for a given set of data (Berenson *et al*, 2002). In analyzing the correlation between the data, a p-value of 0.05 was used to determine significance level.

Descriptive statistics, such as cross-tabulations, were used in analyzing the survey results to describe participant responses based on their demographics. Correlation analyses were utilized to look at relationships between threat from OTT companies and the responses to the other survey questions. T-tests were used to look for differences in participant responses based on specific background characteristics.

4.3.2 Case Study Methodology

A proposed strategy and new business model for telcos will be based on the analysis of the survey outcome. To put the proposal in a practical term, a case study will be used to highlight the progress of one of the telcos in the process of transforming their network and business model. One of the main criticisms for the case study approach is the lack of a formalized methodology for the case study research (Schell, 1992). However, the outcome of the case study will still be very valuable in complementing the findings from the research survey.

The analysis in the case study will be focused on selecting one of the largest telcos that has been successful in transforming their business and try to study the major changes involved in the transformation process. This involves studying the background, the challenges, motivation for the transformation, the major decisions taken during the transformation, and the outcome of the transformation.

Utilizing the case study method will nicely complement the outcome of the survey to act as an empirical inquiry within a real-life context (Yin, 1984). Case study research helps simplifies the understanding of a complex issue and can extend the experience or add strength to what is already known from previous research (Soy, 1997). In this research, the case study will extend the knowledge gained from the survey by examining the progress of one of the more successful telcos and utilize the added knowledge in any proposal for a strategy or a new business model for telcos.

The case study will attempt to find the answers to the following questions:

Why do telcos need to go through the transformation process? The challenges and the status of the telecom industry were discussed in chapter 3. It would be good in the case study to focus on one telco and see what motivated their transformation process.

How do telcos transform their network and business? If the need for transformation is established, the approach used by the telco in the case study will be examined and compared to the theoretical outcome of the survey. The telco in the case study will provide a real example on how the transformation was done given the priorities and tradeoffs that telcos have to face in reality.

How can the transformation enhance the overall competitiveness of telcos? After reviewing the transformation process, it is important to examine the end results for the telco in the case study. This provides a useful verification of the effectiveness of the adopted strategy and provides a practical framework to findings of the research on the expected outcome of the recommended strategy.

To answer the listed questions, a telco will be selected based on the overall performance in the last decade. The challenges and main drivers for the transformation will be reviewed and the major steps in the transformation process will be analyzed. Finally, the outcome as of date of the transformation process will be presented to determine the effectiveness of the transformation process.

The data gathered for the case study will be qualitative and depend on documentation reviews and archival records (Yin, 1994). The data will be gathered from different publications, reports, and studies published either by the company being studied or by an external entity/researcher. The ability to find and access the right information and generalize the findings from the case will be a challenge inherent in the case study approach (Schell, 1992). Therefore, information will be seeked from multiple sources, and the findings will be compared to the outcome of the research survey. The gathered data will be used to develop the conclusion and implications (Tellis, 1997).

4.3.3 Survey Questions

Ten multiple-choice rating scale questions were sent to a group of professionals in the telecom industry. The questions in the survey were directly driven from the study reported in chapter 3 for the industry structure and the trends in the telecom industry along with the competitive status and the challenges and opportunities for telcos. A simplified chart that shows the flow of the questions is shown in figure 4.3.

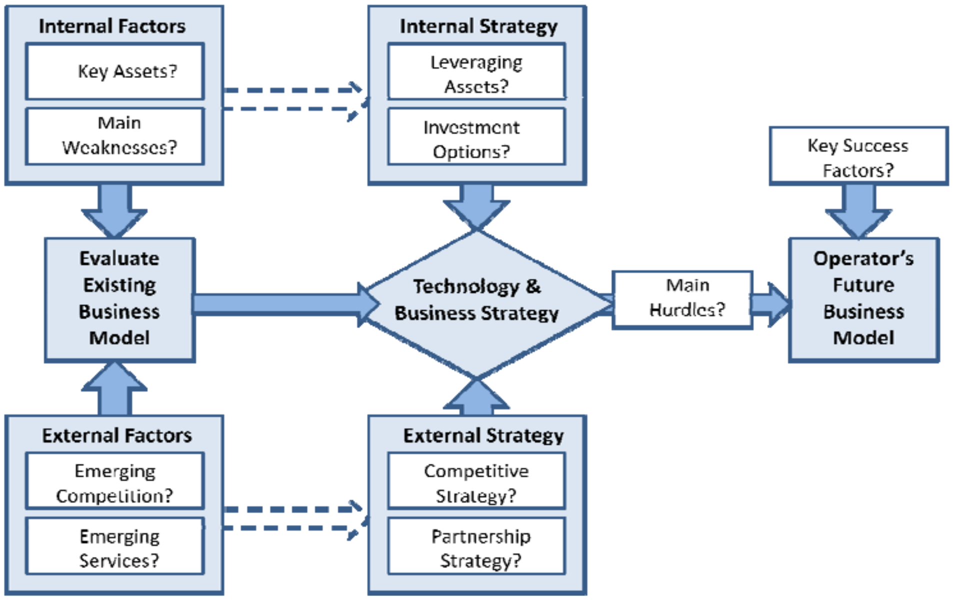


Figure 4.3 Chart for the Flow of the Survey Questions

The survey first checks on the internal strengths and weaknesses in a typical operator and the threats and opportunities in the surrounding environment. The first two are internal factors that relate to the inernal capabilities of the corporate, while the last two are external factors that relate to the environment where the corporate operate. If we go back to the definition of strategy outlined in chapter 2 section 2.2, the strategy was defined as a match between what a company can do (based on corporate's strengths and weaknesses) in the univerise of what it might do (in the presence of environmental opportunities and threats) (Andrews, 1980). Therefore it is imperative to outline these four areas to understand the current strategic position of telcos.

Next, we identify how to best leverage the telecom assets and the right investment priority so telcos can take advantage of the opportunities in the industry. A good strategy would focus investment on further enhancing strengths while mitigating and addressing weaknesses. So the internal strategy in temrs of leveraging assets and investment options is directly related to what is identified as strengths and weaknesses for telcos.

The survey also attempts to identify the best response to the competitive threats and identify the most valuable partner. This is related to the kind of strategy that the corporate is choosing to address the external threats and opportunities in the environment where they operate. So the competitive strategy and the partnership strategy are both directly related to what is identified as threats and opportunities. The partnership strategy was picked based on the trends identified in chapter 3 section 3.4, since telcos are already behind in some of those trends and in many cases they might not own the right capabilities internally so they have to rely on partnerships.

Finally, the survey attempts to highlight the main hurdles in transforming the business model for telcos and the key success factors for implementing the new model. The hurdles will shed light on the areas where telcos might struggle in implementing their new strategy and business model. On the hand, understanding the key success factors is important to assess the expected corporate performance and competitive ability (Houtari *et al*, 2001).

Participants were asked to answer the following questions about the future of wireline/fixed telecom network operators based on the industry analysis performed in chapter 3:

Operators' Main Strengths/Assets:

Identifying a corporate's strength is a key internal component of any strategy as indicated earlier and in chapter 2 section 2.2. Telcos have been around for long time and they have a wealth of knowledge that they have accumulated over the years on how to build and run a telecom network. Furthermore, they have always enjoyed a healthy balance sheet and the existing network they own in the ground can be a major source of differentiation. Finally, the existing relationship they enjoy with their customers can provide them huge leverage as they prepare to offer new products and services. All these assets can be a source of a major competitive advantage since they would be hard to replicate by competitors.

1. Please rank the following assets based on their value to the future of a wireline operator: (1 highest value, 4 lowest value)

a. Existing relationship with customers
b. Owning the physical network infrastructure
c. Financial strength and the ability to bundle services
d. Experience, reputation, and telecom's "know-how"

Operators' Main Weaknesses:

Identifying the weaknesses of a corporate is also an internal component of any corporate strategy (chapter 2 section 2.2). Telcos are facing several internal issues that are weakening their competitive position. Their network did not keep up with the fast growth in traffic and is in a desperate need of upgrade and improvement in quality of the services. At the same time, operators have struggled in stimulating spending from their customers and they have long been criticized for having closed and limited list of services that lacked the flexibility and innovation.

2. Please rank the following internal issues based on their urgency to a wireline operator (1 most urgent, 4 least urgent)

a. Outdated network in need of major upgrades
b. Low quality of service and bad customer support
c. Expensive telecom services and tight budget spending in a tough economy
d. Limited, rigid, and closed portfolio of services that lacks creativity and innovation

Competitive Threats:

Identifying the threats in the environment where the corporate operates is an external component of the corporate strategy (chapter 2 section 2.2). Furthermore, the main forces in the telcom industry that are putting most of the competitive pressure on incumbent telcos were reviewed in chapter 3 subsection 3.3.2. As mentioned earlier, telcos are now faced with stiff competition with too many players that pose significant threats to the telcos' traditional business model. It is very important to understand the amount of threat that each type of companies present in order for a telco to know how to respond.

3. Please rank the following type of companies in terms of threats to the future of wireline operators (1 highest, 4 lowest)

a. Other telcos attacking the incumbent's network through open access
b. Cable, Satellite, and Wireless companies
c. Equipment vendors/system integrators working with builders and municipalities
d. Companies who actually understand the net (such as Facebook, Google, Skype, and Apple)

Promising Future Services:

Identifying promising future services is an attempt to identify the major opportunities in the environment where the corporate operate as an external component of the strategy (chapter 2 section 2.2). Furthremore, the main industry trends was reviewed in chapter 3 section 3.4, and we found that these trends can bring new opportunities for telcos. In order for telcos to benefit from these opportunities, they need to understand the importance of the services that are emerging for both business applications and also for residential applications. This includes better support for old services to keep up with their growth (like high speed Internet Access). It also includes offering new emerging services (like cloud computing and smart home solutions), and generating new revenues based on the level of usage instead of a flat monthly fee.

4. Please rank the following services in terms of revenue potentials (1 highest, 4 lowest)

a. Business services, cloud computing, managed services, SLAs
b. Fatter Internet pipe with the same old legacy services
c. New revenues based on contents, applications, ads, and pay per usage
d. Digital/smart home solutions

Leveraging Strengths/Assets:

Strengths and assets are a source of a competitive advantage for any corporate, and the only way to sustain this competitive advantage is to invest in leveraging and upgrading these strengths and assets (chapter 2 section 2.7). As shown from question 1, telcos currently own many valuable assets. The problem is that the value of these assets is deteriorating. Telcos need to address that and leverage the value of their assets to strengthen their competitive position. These can be done by leveraging the network to generate more revenues and differentiate their service, and also by leveraging the billing relationship with customers to offer new services and/or generate revenues from 3rd parties.

5. Please rank the following options in terms of their effectiveness in leveraging the wireline operator existing assets (1 highest, 4 lowest)

a. Invest in the network to differentiate own services from the competition

b. Use billing relationship to introduce new services and offer billing as a service to 3rd parties (billing as an application)
c. Generate revenues from Wholesale by providing open access to 3rd parties
d. Converge network and services to reduce the cost base

Investment Priorities:

A general overview of the telcos' network was provided in section 4.2 and was illustrated in figure 4.1. The typical telco's network was presented in chapter 3 subsection 3.2.2, and the industry trends were presented in chapter 3 section 3.4. As the telcos try to generate new revenues and try to keep up with the fast growth in existing services, they have to prioritize their investment since they have limited budget. Allocating the investment priority will depend on the status of telco's network in general and the expected impact of the presented industry trend on each segment of the network.

6. Please rank the network investment priority for a wireline telco (1 highest, 4 lowest)

a. Access Networks
b. Core Networks
c. Services and Applications
d. QoS, monitoring, and Control Policy

Competitive Strategy:

In order for telcos to respond to the internal and external challenges they face, they need to choose the right strategy. There are several options that relate to technical and business decisions as well as political lobbying. These options mainly relate to innovation while relying on external partners (chapter 2 section 2.9), innovating internally to maximize and sustain the competitive advantage (chapter 2 section 2.7), focus on the regulatory lobbying to fend off the new competition (chapter 3 subsection 3.3.2), or focus on improving the financial health of the business by reducing cost and competing on prices while trying to maximize the captured value (chapter 3 subsection 3.3.3) .The intent in this question is to evaluate the effectiveness of each option.

7. Please rank the following initiatives in terms of effectiveness in fending off competition (1 most effective, 4 least effective)

a. Strategic collaborations and partnerships

b. Effective regulatory lobbying for favorable regulations on Open Access, Net Neutrality, etc.

c. Continuous investment in innovative products and services

d. Focus on bundling services to offer at competitive prices

Partnership Strategy:

Relying on collaboration and partnership enables the corporate to maximize and expedite the innovation potential in its products while minimizing the invested capital and risk (chapter 2 section 2.9). Due to the many priorities that operators have, partnerships with 3rd parties become inevitable. This could be due to financial limitations in developing own solution, technical limitations in terms of having the "know-how", or the significance of "time to market" and the importance of the customer base that a 3rd party already enjoy. This question attempts to identify the most valuable partner for the future of telcos.

8. Please rank the following possible partners in terms of value to the future of wireline operators (1 most valuable, 4 least valuable)

a. System vendors, system integrators, builders, and municipalities
b. Other operators in wholesale and interconnection agreements
c. Content providers and application developers
d. Net companies like Skype, Facebook, Apple, and Google

Main Hurdles:

Any change in corporate strategy is expected to be faced with hurdles as outlined in chapter 2 section 2.8. There are several hurdles that telcos will face in implementing any new strategy. These hurdles can be internal within the organization or external in the industry and the regulations that govern the telecommunications sector. It is important for telcos to understand the significance of these hurdles as they try to transform their business model.

9. Please rank the following barriers in terms of their impact on the competitiveness of wireline operators as they attempt to transform their business (1. most impact, 4 least impact)

a. Internal resistance in the organization

b. Out-of-date business model that didn't keep up with changes in markets and technologies

c. Eroded profitability, saturated markets, and many initiatives with limited liquidity

d. Too many regulations that are diminishing the attractiveness of the industry

Critical/Key Success Factors:

Identifying the critical/key success factors is important to assess the effectiveness of the corporate's strategy and competitive ability (Chapter 2 section 2.10). These factors will measure the degree of success that telcos must achieve as they transform their business model. This question tries to indentify the importance of each success factor. The identified critical success factors were driven from the industry analysis reported in chapter 3. The operators can focus on their competency and only worry about modernizing their network, or they can try to capitalize on the emerging trends in the industry and offer all services to maximize their revenue potential. They can also drive to transform their business to have a lean operation and cost-competitive structure, and they can also allocate significant resources to lobby with the regulators to fend-off competition.

10. Please rank the following Key Success Factors in terms of their significance to evaluate the effectiveness of any new business model for wireline operator

a. Have a modern, scalable, and reliable network infrastructure by focusing on the core business as Network Operator

b. Become a one-stop shop for all telecom services and applications

c. Have a lean organization with efficient operation and low cost structure

d. Extend the quasi-monopolistic position in the marketplace

Correlation with Segment within the Telecom Industry:

It is important to identify the background of the participants and correlate their responses to where they fit in the telecom value chain. The options listed in this question were directly driven from the telecom value chain reviewed in chapter 3. The participants might have different opinions and biases depending on the line of business of their company.

11. Please indicate the type of business of your company
    a. Chip/component vendor
    b. System vendor/manufacturer
    c. Operator
    d. Others (education, consultant, content provider, app developer, etc)

Correlation with Geographical Location:

Since each part of the world has its own unique views on challenges and opportunities in the telecom sector, it is important to identify the regional location of the participants in the survey. It would be hard to track each participant to his/her specific country, but getting an idea about the region or the market will be helpful. As reviewed in chapter 3, the regulatory environment is different in different regions of the world, and the competitive threats and customers' preferences are different as well. Therefore, it is critical to correlate responses with the geographic location of each participant.

12. Please indicate your location
    a. North America
    b. Europe
    c. Asia Pacific
    d. Emerging Markets (South America, Middle East, Africa)

Correlation with Position within a Company:

The professional position of participants can greatly influence how they respond to the survey since the visibility that each participant has of the status of the industry can be determined by his/her position. Participants with executive positions should have better view of the telecom industry and therefore their responses would be more valuable and should be given higher weight than other participants.

13. Please indicate your position
    a. Executive (Director/VP/C-Level)
    b. Line Manager/Supervisor

c. Engineer/individual contributor

d. Others (educator, consultant, etc)

4.3.4 Survey Data Modeling

The questions in the survey were designed to capture all logical possibilities where prioritizing is required since each possibility holds some level of importance. Some questions have options that have almost equal probabilities of getting selected by the participants. Other questions might have options with different probabilities where some options might be more obvious as the right choice than others. This section will attempt to model the possible responses of the participants so the survey outcome would fall in several possible segments. These segments will not capture the entire population for all the theoretically possible answers, but is predicted to capture the vast majority of the population.

If we look first at table 4.1, we find that the options in the survey questions cover five different areas (each has the corresponding color between two paranthesis):

1. Network (Rose color): which is the infrastructure and the equipment operated by the telco and connect to their customers
2. Service (Peach color): Which covers the telecommunication services provided by the telco to customers. It is not limited to traditional services, such as telephone, TV, and Internet, but also includes business services, access to contents, and access to applications
3. Regulatory (Light Green color): This covers the legal framework that defines how the telco is authorized to operate. It is usually a government mandate that telcos have to comply with according to their operating license.
4. Finance (Lavender color): This is for the financial health of the telco which determines their profitability and overall competitiveness but also can determine how much the telco can afford to invest
5. Corporate (Light Blue color): It covers the intangibles within the telco such as the human resources factors, culture and corporate strategy

Key Assets	Emerging Competition	Leverage Assets	Competitive Strategy	Main Hurdles
Network Ownership	MSOs, Sat, Wireless	Network Differentiation	New Products & Svcs	Internal Resistance
Customer Relationship	Builders, Integrators	New Services	Bundle & Lower Cost	Old Biz Model
Financial Strength	Open Access Telcos	Convergence	Regulatory Lobby	Financial Limitations
Telecom Know-How	Internet Companies	Wholesale Revenues	Partnerships	Regulatory

Main Weaknesses	Emerging Services	Investment	Partnership	Key Success Factors
Old Network	Business, Cloud	Access Networks	Internet Companies	Modern Network
Limited Services	Contents/Apps/PPU	Content/Apps Platform	Content/Apps Providers	Full Service Portfolio
Expensive Services	HIS	Core Networks	Builders & Municipalities	Lean Operation
Bad Quality	Smart Homes	QoS & Monitoring	Wholesale Partners	Monopoly Position

Table 4.1 Options in the survey

The five areas are shown in table 4.2. There is a direct correlation between table 4.1 and 4.2. For example, the key assets of an operator can be in the area of: Network in the form of Network Ownership, Service in terms of the customer relationship they have, Finance in terms of the financial strength or Corporate in terms of telecom know how.

Key Assets	Emerging Competition	Leverage Assets	Competitive Strategy	Main Hurdles
Network	Network	Network	Service	Corporate
Service	Regulatory	Service	Finance	Service
Finance	Service	Finance	Regulatory	Finance
Corporate		Regulatory	Corporate	Regulatory

Main Weaknesses	Emerging Services	Investment	Partnership	Key Success Factors
Network	Service	Network	Service	Network
Service	Network	Service	Network	Service
Finance				Finance
				Regulatory

Table 4.2 Areas Covered in the Survey Questions

An area might be present in multiple options for some of the questions. For example, the question on emerging services has three options under service and one under network since high speed Internet service mainly involves an upgrade in the network infrastructure of the operator.

Based on the classifications of the options in the survey questions and the background information provided in chapter 3 for competition (covered in 3.3) and industry trends (covered in 3.4), we can model the possible outcome of the survey.

Starting with question one, although the financial strength and the telecom know-how have been historically a source of strength for telcos, but their importance has been diminishing over time. It is expected that participants would put more value on the existing relationship with customers and the ownership of the physical infrastructure. This leads to question five for leveraging the assets. Investing in the physical network can be a great source of differentiation from the services of the competition, and also the billing relationship with customers can be a great source of competitive advantage since it opens the door to gracefully introduce new services from the operator or other business partners. It is expected that the answers will be segmented within these two options. The other two options are less probable unless participants feel that network ownership can have a significant financial advantage in terms of converging and lowering the overall cost, or utilizing the network ownership to provide access to other operators and generate additional revenues from wholesale.

We go next to question two regarding the operator's weakness. All four options are almost equally important, but the need to upgrade the network and offer wider portfolio of open and innovative services are expected to be perceived as the two major areas of weaknesses for operators. As we determine the main areas of weaknesses for operators, we have to compare it with the most threatening competition, which leads us to question 3. All parties in the options pose a very significant threat on the operators' traditional business model. But perhaps the most significant threat will be perceived to come from OTT companies due to their emergence and the success they have been enjoying on the expense of the operators. Some participants might also choose the first option for other companies attacking through open access, but this will depend on the regulatory environment in the participant's country (Federal Communication Commission, 1996; Forzati *et al*, 2010; Gao, 2011; Grubes and Verboven, 2011; Curwen and Whalley, 2006).

Identifying the competitors that pose the biggest threat can feed into two areas. The first is in question 7 where we try to determine the best way to fend-off competition, and the second is in question 8 where we try to identify the most valuable potential partner. Regarding the strategy to fend-off competition, all options are very critical and might be equally important. However, based on where operators stand today, answers are expected to be segmented around the urgent need for more partnerships and investing in innovative services. Again here, based on the geographical location of the participant and the regulations associated with that location, some participants might highly value the importance of lobbying with the regulators. The other question is on partnership, the two choices that would bring a significant value to the operators and mitigate some major weaknesses they have are the content providers and the OTT companies. Therefore, these two choices are expected to be selected by most participants.

Most operators enjoy a good financial health. However, they have many priorities for investment so they need to forecast the most profitable future services and identify the investment priorities in their network. Question 4 addresses the future services where it is expected that participants would choose business services/cloud computing and the services based on contents and pay per usage since these are emerging very strongly in the industry as indicated in chapter 3. Based on the selection of the services, participants get to prioritize investment in the network in question 6. Providing the weaknesses addressed in question 2 and the future services in question 4, participants are expected to select investing in Access Networks and also in new applications/services/contents.

Investing in “Access Networks” or “Core Networks” is a good choice for respondents who identified “Old Networks” as an area of weakness, or “High Speed Internet” (HSI) as an emerging service. Investing in “Contents/Apps Platform” will be critical if “Limited Services” was the weakness and “Business/Cloud”, “Contents/Apps/PPU”, or “Smart Homes” were selected as the emerging services. On the other hand, “New Products & Services” should be the competitive strategy of choice if participants selected anything but “HSI” as an emerging service and anything but “Open Access Telcos” as an emerging competition. Similarly, “Bundle & Lower Cost” is a good strategy if services are too expensive and if the telco wants to be more competitive from a price point of view. “Regulatory Lobby” could be an effective competitive strategy against “Open Access Telcos” to limit their options to access the network and against “OTT companies” to prevent Net Neutrality. Finally, “Partnership” can be crucial to provide “Business and Cloud” services, and to have a wider portfolio of “Contents/Apps/PPU” services. Partnership can also be more effective in competing against “OTT companies”.

As we put the responses of the survey together to highlight how an operator can transform their operation, it is important to rank the expected hurdles to implementing the new strategy. All options in question 9 are considered significant hurdles that need to be addressed by the operators. The one option that might receive higher selection rate might be the out-dated business model since everything else in implementing a new strategy hinges on changing the outdated business models that telcos used for years. Again, geographical location might influence some participants to choose the regulatory option due to the strict and counter-productive regulation that exist in their local market. “Internal Resistance” can be a hurdle when the telco tries to make changes in the network or pursue new products or partnerships. People resist change in general, especially if they feel that it impacts their livelihood. Having “Old Biz Model” can be a major hurdle as the telco tries to transform their business to change from a network operator into a service and solution provider. Another hurdle is the “financial limitation” which would limit the telco from pursuing the different investment initiatives or leveraging the assets. Last but not least, “Regulatory” authorities can be a big hurdle as telcos try to generate fair revenues from wholesale and as they lobby to protect themselves from attackers.

The final question addresses the critical/key success factors for transforming the operator’s business model. The responses are expected to be segmented around the first two options. In these options the operator will pursue to have a modern and reliable network and also to have a wider portfolio of products and services whether developed in-house or provided from 3rd party vendors. The four options in this question cover the four key areas of the survey: Network, Services, Finances, and Regulatory. These can be considered the four key areas for the success of any telco. Participants who think that operators should invest in the network and differentiate themselves based on their network will chose the first option. Participants who think that operators should start investing in contents, applications, and services will choose the second option. Participants who feel that the success of telcos will depend on how competitive price-wise they could be, will choose the third option. Finally, participants will feel the success of operators will depend on much control they have over their network by keeping their attackers away will choose the fourth option.

To model the possible outcome of the survey we have to understand the possible biases of the participants. Therefore, there will be three questions to determine the demography of participants so the backgrounds can be associated with their responses. Responses of participants can be influenced by their geographical locations, and this is especially applicable to the regulatory environment which varies in different parts of the world. Another possible influencing factor is the type of company where the participant work and where that company fits in the telecom value chain. The most relevant data would come from participants who work for a telco. Participants from other parts of the telecom value chain can still provide insightful information, but they might be influenced by the biases of their company and might not be fully aware of the challenges currently faced by the operators. The final possible factor that might influence the responses of a participant is where that participant fit in the chain of command of his company. Clearly, participants with leadership role, and especially executives, would have much better visibility of the status of the industry and the best way forward.

4.4 Analyzing the Research Findings

4.4.1 Survey Major Findings

The total number of telecom professionals who participated in the survey before it was closed was 122 participants. The participants have covered all the subsets in terms of geographical regions, position within the chain of command, and the entire telecom value chain. The survey was open for about 4 weeks from mid February to mid March 2011. The followings are the findings and the interpretation for the outcome of the survey:

Biggest threat on telcos comes from the OTT companies. Business services and cloud computing have the highest potential for future revenues:

OTT companies were viewed to have the highest threat on telcos by 48 or 39.3% of the participants (Table 4.3a). For ease of reference, this subset shall be referred to hereafter as the OTT-threat subset. Cable, Satellite, and Wireless companies came next in terms of their threat with 33.6%, followed by other telcos attacking through open access with 25.4%.

For the rest of the survey question, we will be comparing the responses of the total population with the responses of the OTT-threat subset.

Highest Threat on Telcos	%
Other telcos	25.4
Cable & Wireless Companies	33.6
Vendors, Builders, municipalities	1.6
Internet/OTT Companies	39.3

(a)

Highest Potential Services	Total %	Subset %
Business Services	52.5	58.3
High Speed Internet Access	14.8	8.3
New Services, Aps, Content	26.2	31.3
Smart Home Solutions	6.5	2.1

(b)

Table 4.3 (a) Threats on telcos (b) Services with high revenue potential

Business services and cloud computing got 52% as the service with the highest revenue potential. It was followed by new services based on contents and pay per usage at 26.2%. Ultra high-speed Internet access came third at 14.8% (Table 4.3b). Interestingly, the OTT-threat subset had the top two choices even higher. This makes perfect sense since it is harder for OTT companies to address business customers and provide service level agreements and managed services.

		Potential Service Ultra-speed Internet
Threat of OTT companies	Correlation Coefficient	-0.2
	p-Value	0.007

Table 4.4 Correlation between the OTT companies threat and the potential of ultra-speed Internet access for revenues

Table 4.4 shows a significant inverse correlation between OTT companies' threat and the potential of ultra high speed Internet for future revenues. OTT companies benefit most from customers with ultra-high speed Internet access as it improves their products' quality and paves the road for new products. Therefore, if telcos invest only in providing higher speed for Internet access but without providing their customers a complete portfolio of products and services that utilize that speed, they would risk turning into a connectivity provider. The OTT companies will then benefit from the faster speed by providing low-cost or even free substitute services and applications that will capture the value created by the faster Internet access. That explains why OTT companies would be considered a higher threat when the focus on the telcos on just on providing ultra-high speed Internet access.

Existing relationship with customers is Telco's main strength. Bad network quality and customer service are Telco's biggest weakness:

The survey shows a consistent response in considering existing relationship with customers as the most valuable asset for telcos (Table 4.5a). Owning the physical network and having the financial strength were rated lower. The experience accumulated by the operators over the years and the telecom "know-how" were last due to the technology shift which neutralized telcos' experience. OTT companies are successful because they have demonstrated superior understanding of technology evolution and customers' needs.

Most Valuable Asset	Total %	Subset %
Customer Relationship	45.9	47.9
Network Ownership	18.0	20.9
Financial Strength	19.7	20.8
Telecom "know-how"	16.4	10.4

(a)

Most Urgent Issue	Total %	Subset %
Outdated Network	24.6	10.4
Degrading Quality	51.6	62.5
Expensive Services	7.4	6.3
Limited Services & Aps	16.4	20.8

(b)

Table 4.5 (a) Telcos' strengths (b) Telcos' weaknesses

Bad network quality and customer service were considered telcos' biggest weaknesses at 51.6% and were even higher at 62.5% for the OTT-threat subset (Table 4.5b). This could be a real issue for telcos as it is hard to retain customers when OTT companies can provide better service at lower prices.

OTT companies are not the telcos' biggest threat when the network is old as there is a significant inverse relationship. Old networks deteriorate the quality of the OTT companies' services which makes them unattractive to customers.

		Weakness: Outdate Network	Weakness: Limited, Rigid, and Closed Products & Services
Threat of OTT companies	Correlation Coefficient	-0.2	0.19
	p-Value	0.03	0.04

Table 4.6 Correlation with telcos' weaknesses

When telcos have limited, rigid, and closed portfolio of products and services, OTT companies become a much bigger threat as there is a significant correlation as shown in table 4.6. This is mainly true if the network is relatively modern while the applications and services are lagging behind.

Network convergence and investment in Access Networks and Services and Applications should be Telcos' top priority:

Participants in the survey felt that the best way to leverage existing telcos' asset is by investing in the network to differentiate own services, and converging the network to reduce cost (Table 4.7a). The OTT-threat subset placed higher weight on network convergence since it enables telcos to provide bundled services to effectively compete at low cost.

Best Asset Leverage	Total %	Subset %
Invest in Network	42.6	35.4
Billing Relationship	13.9	18.8
Wholesale Revenues	11.5	8.3
Converge Network	32.0	37.5

(a)

Most Urgent Investment	Total %	Subset %
Access Network	45.1	37.5
Core Network	15.6	12.5
Services & Applications	34.4	45.8
Quality of Service	4.9	4.2

(b)

Table 4.7 (a) Leveraging telcos' asset (b) Investment priorities

Network Investment can be dangerous if not accompanied by investment in services as OTT companies might be the one capturing the value. This is why the majority of participants (45.1%) voted for investment in Access Networks and (34.4%) for Services and Applications (Table 4.7b). The ratios were almost reversed for the OTT-threat subset due to the importance of investing in Services in competing with OTT companies.

		Asset Leverage: Converge network to reduce cost	Investment: Core Network	Investment: Services & Apps
Threat of OTT companies	Correlation Coefficient	0.2	-0.3	0.2
	p-Value	0.02	0.001	0.004

Table 4.8 Correlation with asset-leverage and telcos' investment

The correlation analysis (Table 4.8) shows an inverse relationship with investment in Core Network and a significant relationship with investment in Services and Applications. The former might enhance the OTT companies' competitive position since they benefit from the telcos' modern network, while the later will definitely enhance the telcos' competitive position.

Telcos must continuously invest in differentiated products and services and pursue partnerships with Content Providers and OTT companies:

The survey shows a strong support for continuous investment in differentiated products and services (42.6%) as the best strategy for Telcos, to be followed by converging the network and relying on partnerships. This outcome was more emphasized by the OTT-threat subset where 56.3% of the participants felt that the counter attack should be through innovation (Table 4.9a).

As shown in table 4.9b, participants considered Content Providers (36.9%) as the most valuable partner followed by OTT companies (25.4%). However, the OTT-threat subset had stronger opinion on partnering with Content Providers (45.8%) and with the OTT companies themselves (33.3%). Providing customers access to unique contents is the best way to compete. It also makes sense to selectively partner with some OTT companies instead of competing head-to-head. The products of these companies have become too popular to ignore and it is in the best interest of telcos to enter into agreements that can deliver higher value for both companies.

Most Effective Strategy	Total %	Subset %
Partnerships	23.0	18.8
Regulatory Lobbying	12.3	8.2
Continuous Investment	42.6	56.3
Bundling Services	22.1	16.7

(a)

Most Valuable Partner	Total %	Subset %
Vendors, Builders	25.4	14.6
Wholesale Operators	12.3	6.3
Content Providers	36.9	45.8
Internet/OTT Companies	25.4	33.3

(b)

Table 4.9 (a) Telcos' business (b) Partnership strategy

The survey data (Table 4.10) also shows a significant inverse correlation with system vendors, integrators, builders, and municipalities, and with other wholesale operators. Partnerships with these companies add value to telcos but would not truly differentiate them when the main threat comes from OTT companies.

		Strategy: Continuous Investment	Partners: System vendors, Integrators, builders, municipalities	Partners: Other wholesale operators	Partners: Content Providers and Apps Developers	Partners: OTT companies
Threat of OTT companies	Correlation Coefficient	0.2	-0.3	-0.2	0.2	0.3
	p-Value	0.004	0.002	0.005	0.002	0.0005

Table 4.10 Correlation with business and partnership strategy

Telcos must reinvent their business model and address internal resistance as they modernize their network and enhance their product portfolio:

As shown in table 4.11a, the majority of the participants (54.9%) felt that the main barrier to transforming telcos' business is the out-dated business model which did not keep up with changes in markets and technologies. Interestingly, the second barrier was internal resistance (24.6%). So 79.5% of the participants felt that the main barriers were internal.

Regarding key success factors to telcos' future, 42.6% of the participants felt that it is having a modern, scalable, and reliable network infrastructure. While 34.4% of the participants felt that telcos should enhance their product portfolio, and 20.5% felt that telcos should have a lean organization with low cost structure (Table 4.11b).

Biggest Barrier	Total %	Subset %
Internal Resistance	24.6	25.0
Outdated Business Model	54.9	58.3
Eroded Profitability	14.8	10.4
Strict Regulations	5.7	6.3

(a)

Best Success Factor	Total %	Subset %
Modern Network	42.6	47.9
Offer all Telecom Services	34.4	27.1
Lean/Efficient Organization	20.5	25
Extend Monopoly Position	2.5	0.0

(b)

Table 4.11 (a) Telcos' transformation barrier (b) Key success factors

OTT-threat subset had a stronger opinion about having a modern network (47.9%) and a lean organization (25%). A significant correlation is shown in table 4.12 with having lean organization due to the importance of cost in competing with OTT companies.

		Success Factor: Lean Organization
Threat of OTT companies	Correlation Coefficient	0.1
	p-Value	0.03

Table 4.12 Correlation with key success factors

Filtering the Data to Detect Background-Related Biases:

Cross-tabulation was performed to detect biases based on participants' backgrounds. Data was filtered to detect the number of participants in each group that felt that OTT companies pose the highest threat.

In this analysis we filter out the responses of participants based on background criterias and compare the sample with the rest of the population. We try to identify if there is a significance difference in the means of both samples based on the p-value. The same p-value of 0.05 will be used here to determine significance in differences between the two mean values.

Line of Business	Total %	Subset %
Component Vendor	12.3	10.4
System Vendor	45.9	45.8
Operator (Telco)	20.5	25.0
Others	21.3	18.8

(a)

Position within Company	Total %	Subset %
Engineer	24.6	27.1
Line/Mid Management	27.9	20.8
Executive	38.5	43.8
Educator,Consultant, Others	9.0	8.3

(b)

Table 4.13 (a) Line of business (b) Position of participants

Participants were asked to answer three background questions. The first was about their line of business across the telecom value-chain. Table 4.13.a shows the distribution in the survey for the overall participants and for the OTT-threat subset. We notice that higher percentage of participants who work for an operator believes that OTT companies have higher threat.

The second background question asked participants to indicate their position within their organizations. Table 4.13.b shows that Executives are significantly more likely to view OTT companies to have the highest threat on Telcos.

As shown in table 4.14, if we compare the responses of executive operators to the rest of the population, we find a significant difference in the response relative to the threat of OTT companies. Similar significant difference appears in the importance of investing in services, partnering with content providers, and considering the out-of-date business model as the main barrier for Telcos.

Category/Biases	Area	Mean		t-value	p-value
		Exec.Opertrs	Rest		
Executive Operators vs. rest	Threats: Internet/OTT Companies	2.6	1.6	-2.6	0.008
	Investment: Services	2.4	1.7	-2.1	0.03
	Partner: Content Providers	2.6	1.9	-2.3	0.02
	Barriers: Outdated Biz Model	2.9	2.2	-5.2	0.0001

Table 4.14 2-Sample t-test to Determine Significant Differencecs in Responses between Executive Operators and the Rest of the Population

The third background question (Table 4.15) asked participants to indicate their geographical region. When it comes to evaluating the threat from OTT companies, Asia Pacific participants felt less threatened by OTT companies than the rest of the world.

Geographical Location	Total %	Subset %
North America	41.8	41.7
Europe	13.9	20.8
Asia Pacific	13.9	6.3
Emerging Markets	30.3	31.2

Table 4.15 Geographical location of participants

The t-test in table 4.16 indicates a significant deviation in the response of participants from Asia/Pacific regarding the OTT companies' threat than the rest of the population. This is consistent with their responses to other questions where they placed more importance on ultra-high speed Internet access and less on the value of content providers and OTT companies as potential partners. This is mainly due to the unique preferences of Asia/Pacific customers that are adequately served by local providers.

What is listed in table 4.16 is only the parameters where it was found that there is a significant difference in the means of the responses of the sample of participants who identified their geographical location as Asia or Europe and the rest of the population for each case. As mentioned earlier the p-value of 0.05 was used to determine significance. Other parameters not listed in the table did not show any significant difference in the responses between the two samples.

Category/Biases	Area	Mean		t-value	p-value
		Asians	Rest		
Asia vs. rest of world	Threats: Internet/OTT Companies	0.9	1.8	2.7	0.006
	Service: Ultra high speed Net	2.1	1.1	-3.5	0.0007
	Partner: Content Providers	1.4	2.0	2.4	0.01
	Partner: Net Companies	0.7	1.5	2.4	0.01
Europe vs. rest of world		Europeans	Rest		
	Investment: Services-Apps	2.4	1.7	-2.6	0.009
	Partners: Content Providers	2.5	1.9	-2.2	0.02

Table 4.16 2-Sample t-test to Determine Significant Difference in Responses between Asian and European Participants and the Rest of the Population

4.4.2 Inferences Based on Data Statistical Analysis

There are several inferences that can be drawn from the survey data based on the relationships between the responses and the performed t-tests. The full data is provided in Appendix I, and the statistical analysis are provided in Appendix II and Appendix III. The following can be drawn based on the statistical analaysis of the data:

1. (Question 2 and Question 3) Having a low quality in the network neutralizes the significance of owning the physical network as a competitive advantage for the telco. This is due to the significant positive correlation between low quality in the network and the threat of other telcos attacking through Open Access (Appendix II: correlation coefficient = 0.2, p-value =0.01).

2. (Question 1 and Question 2) Having a weak financial position adversely affect the ability of the telco to have a modern network and makes the outdated network a major weakness for the telco. This is mainly due to the significant inverse correlation between the telco's financial strength and having an outdated network (Appendix II: correlation coefficient = -0.3, p-value = 0.001).

3. (Question 2 and Question 8) When the network is outdated, partnering with OTT companies become more important as it helps the telco to remain lean and focus their investment on upgrading their network while getting the services from the OTT companies. This is due to the significant correlation between having an outdated network as a weakness and pursuing OTT companies as a potential partner (Appendix II: correlation coefficient = 0.2, p-value = 0.02).

4. (Question 3 and Question 7) When other telcos attacking through Open Access become a significant competitive threat, it becomes more critical for telcos to pursue collaborations and partnerships as a business strategy. This is due to the significant correlation between the increased threat of Open Access Telcos and the value of collaborations and partnerships as a strategy (Appendix II: correlation coefficient = 0.2, p-value = 0.01). This enables the telco to enhance their portfolio as they seek differentiation from the competition

5. (Question 2 and Question 3) Companies attacking through Open Access can be a bigger threat when the telco has a rigid and closed portfolio of products (Appendix II: correlation coefficient = 0.3, p-value = 0.004). This is basically because the attackers will benefit from having a modern network to offer more innovative products and services that can take away revenues from the incumbent telco.

6. (Question 1 and Question 4) The relationship with existing customers is very important in introducing new services, content, and applications based on pay per usage (Appendix II: correlation coefficient = 0.2, p-value = 0.01).

7. (Question 5 and Question 7) Collaborations and partnerships also become more important as a strategy when telcos intend to utilize the billing relationship with customers to introduce new services (Appendix II: correlation coefficient = 0.1, p-value = 0.03). This can be extended to not only the services outside the expertise of

the incumbent telco, but also to other commercial products and services outside telecom where the incumbent telco can be paid for advertising or a percentage of the sale as part of the promotion

8. (Question 5 and Question 7) There is a direct relationship between converging the network and services and bundling the services (Appendix II: correlation coefficient = 0.2, p-value = 0.002). This enables the telco to reduce the cost base by having a highly leveraged network and pass some of the savings to the customers in terms of bundled products and services.

9. (Question 5 and Question 9) Internal resistance within the organization has an adverse impact on any initiatives that involve updating the network or converging the network (Appendix II: correlation coefficient = -0.2, p-value = 0.01). Staff might resist such a major change as there might be a conflict of interest in how it impacts their position and future with the company.

10. (Question 7 and Question 10) Collaborations and partnerships with external parties become more important if the telco wants to pursue having a lean organization (Appendix II: correlation coefficient = 0.2, p-value = 0.002). This is due to the ability to utilize the resources and the expertise of third parties to offer new products and services while keeping investment and staffing costs at a minimum.

11. There are other conclusions that are rather predictable where quality was a bigger issue in regions that still run older networks like emerging markets and part of Europe (Question 2 and Question 12). Same applies to the regulatory impact on telcos (Question 3 and Question 12, Question 9 and Question 12) and the potential of advanced services like smart home solutions (Question 4 and Question 12). The full analysis can be found in appendix II.

4.5 Summary

Changes in technologies have resulted in a paradigm shift in the telecom industry where it became critical for telcos to rethink the way they do business. A global research study conducted with 122 telecom professionals confirmed the hypothesis that OTT companies pose the highest threat on the telcos' future and that telcos need to change their business model.

The study found that telcos' top priority should be addressing their outdated business model, the internal resistance within the organization, and the deteriorating quality in their networks and services. Investments in Access Networks and in differentiated services and applications were found to be most urgent. Business services and cloud-based solutions were perceived to have the highest potential for future revenues. Partnerships and collaborations were also found to be critical to the telcos' future, and content providers along with application developers were considered the most valuable potential partners.

Statistical analysis has demonstrated a significant correlation between participant background and their responses. OTT companies were a bigger concern for telcos and executives, and were found to be a bigger threat to telcos in North American and Europe as compared to Asia/Pacific and the Emerging Markets.

The study has showed that in order for telcos to effectively compete against OTT companies, they have to focus on continuous innovation in new products, improve the network/service quality, and converge to lower their cost base. Owning the physical network can be a factor if used to offer bundled products/services at competitive prices. This significantly enhances customer retention and paves the way to build on the existing customer relationship to introduce new products and services. Consequently, telcos will be able to defend their core business and have the best competitive position to create and capture values.

Chapter 5

Innovating the Telcos' Future Business Model

5.1 Introduction

Previous chapters have discussed the intense competition in the telecom industry and the challenges that telcos face. When there is a lack of a true differentiator and when competition is purly based on price, it would be hard for operators to establish any competitive advantage. At the same time, operators have to make significant investments to upgrade their networks but without being able to profit from the traffic that is growing exponentially over the network.

Another significant factor for operators is the declining revenues from voice services. Voice services have been the main cash generating engine for operators, but the availability of lower-cost Internet-based substitutes along with the usage of mobile phones has resulted in a technology shift. Therefore, operators have to transform their business to compensate for the declining voice revenues, and to be in a position to monetize the significant investment they have to make in the network.

Chapter 4 has researched the technical, economical, and strategic factors faced by management of telcos. In analyzing the findings of the research it was found that operators need a new business model that can help the operators turn the challenges they face into opportunities. This chapter proposes a new strategy and a business model for the telcos based on the teachings of the BOS and the findings of the research study in chapter 4. FTTH technology is used as an example on how telcos can deploy a new technology as BOS strategy based on the observed trends in the industry. Other opportunities from the trends in the telecom industry are presented as well to demonstrate how telcos should take advantage of these opportunities to have the best competitive position. A case study examines how an operator was able to transform the network and business to illustrate an example for implementing strategic initiatives in line with the research finding and proposal.

5.2 Implications for Telcos from the Research Study

The research presented in chapter 4 has shown that telcos will have many challenges if they continue with the same mode of operation. They face the highest threat from OTT companies in addition to the other threats from the more traditional competitors. One of the conclusions in chapter 4 was that the main hurdle for the future of most telcos is their outdated business model which did not evolve with the changes in technology and the industry. But what approach should telcos take as they try to reinvent their business model to maximize their profitability and enhance their overall competitiveness?

The main differentiator for telcos comparing to OTT companies come from the fact that they own the physical network and the billing relationship with their customers. Any new strategy and business model will have to be based on leveraging these strengths while trying to compete with the innovation and low cost structure of OTT companies.

In figure 5.1, we list the key strategic initiatives that have to be undertaken by telcos as part of their new business model. Owning the physical infrastructure can only be an advantage if it is modernized. The "creative destruction" process will stimulate the evolution of every industry and companies need to keep pace through innovation (Shumpeter, 1942). This means that telcos have to continue to invest in their network infrastructure and match it with innovations in products and services. This investment helps addressing the network quality problem which participants in the survey perceived as the main weakness for telcos. Along the same line, telcos have to upgrade their internal capabilities in terms of processes and knowledge base. The telcos expertise has been neutralized by the vast changes in technology and the employees might find their knowledge only specific to the legacy networks (Papalexandris and Nikandrou, 2000). Upgrading the expertise of employees might be the most important investment that a telco makes since it upgrades the core competency and minimizes the expected internal resistance from these employees to the required network transformation (Goles *et al*, 2008). Employees will no longer feel threatened by these changes, but instead they would embrace it and contribute positively to the process (Maurer, 1996). In contrast to that, if companies relied solely on external hiring to acquire expertise, employees will feel that their knowledge is becoming obsolete. They would, therefore, resist any changes that they perceive would impact their job security (Maurer, 1996).

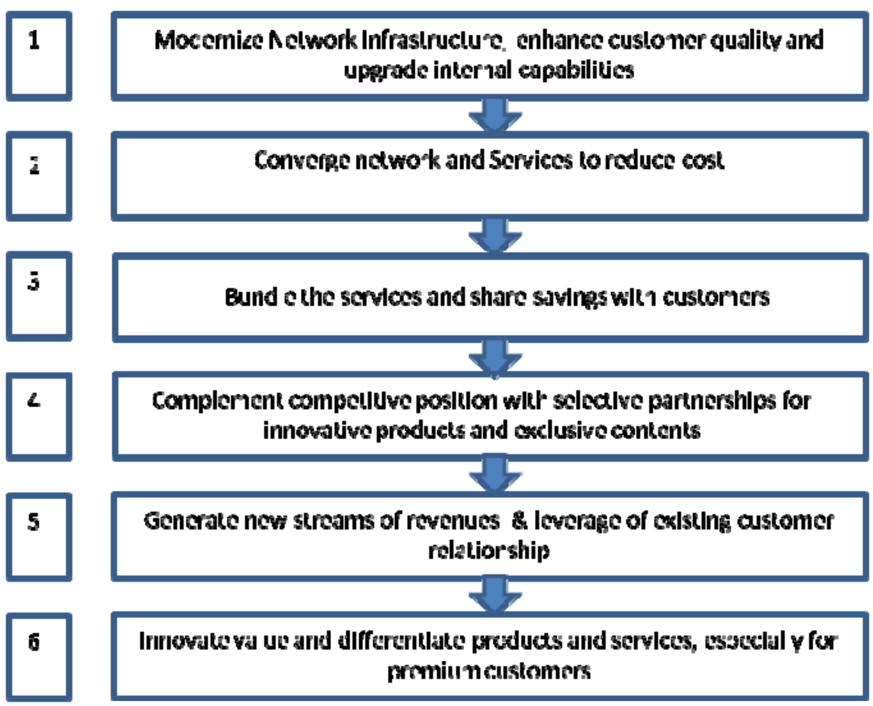


Figure 5.1 Strategic Initiatives for Telcos Based on Survey's Findings

Network and service convergence has to be a major part of any upgrade the telcos do in their network. This leverages the investment so all services can utilize the same infrastructure which translates into cost savings. The savings can be shared with customers as services get bundled in packages. This can provide telcos a significant advantage compared to OTT companies who are not in a position to provide all services. The total savings will discourage customers from getting services separately from different providers, and this will improve the customer stickeness.

To enhance the competitive position even further, telcos need to complement their products and services through selective partnerships in the industry. The survey found that even though OTT companies are the major threat for telcos, but they, along with content providers, are the most valuable potential partners for telcos. Telcos should not just concede to OTT companies as they would forego significant revenues that have huge growth potential. Nor should telcos try to compete head-to-head with the OTT companies, since these companies are faster and more innovative. A better option would be to have a selective partnership that would be mutually beneficial.

Once telcos enhance their portfolio through their own innovation and through partnership, they can utilize their other strengths through the billing relationship they already have with their customers. This provides telcos a competitive advantage comparing to OTT companies, especially for premium customers and business customers.

5.3 The Applicability of BOS in Telecom

As we found in the study from chapter 4, telcos are at a crossroad. What has worked for them in the past is no longer working. They have lagged behind in terms of adapting to the massive changes that the industry has witnessed in the last decade. They basically have to reinvent themselves in terms of what services they offer, how services are offered to customers, how they structure themselves, and how they compete in the marketplace**.**

The telecom industry, similar to most industries, has been following the S-C-P in terms of the competition between the different players in the industry. However, this have clearly led to a tremendous pressure on the industry players as they try to offer customers more advanced telecom services for lower prices. Telcos have been competing head-to-head with each other while watching their profit erodes and market share shrinks. The research study reported in chapter 4 has founded that OTT companies pose the highest threat to the future of telcos. The study also showed that telcos should not waste resources on regulatory lobbying and instead should try to fix their quality problems and pursue offering new and innovative products and services at low prices (Survey Question 10).

When reviewing the entire findings of the chapter 4 study, we find that an appropriate strategy to be followed by telcos should be in line with most of the teachings of the Blue Ocean Strategy. The competition has become unconventional while telcos are still trapped in competing with their old nemesis in the form of other telcos and cable companies. In the process, telcos have been losing their innovation and risking becoming a utility provider.

The next sections will go in details in how telcos can utilize BOS in deploying FTTH, and the same principles would apply to LTE, cloud computing, and interactive videos.

5.3.1 Relevant Components in BOS to Today's Telcos

The industry trends presented in chapter 3 can provide rich opportunities for telcos if they utilize the right strategy. Some of the emerging disruptive technologies that should be of special interest to telcos are: ultra high speed broadband in the form of FTTH for fixed networks, LTE for mobile networks, cloud computing, and interactive video. These technologies can be utilized as the building blocks in transforming the business of telcos.

An overview of BOS was presented in chapter 2. At the moment, most telcos are struggling while battling in head-to-head competitions and watching their revenues shrink. BOS teaches to create uncontested market space instead of continuing to compete in existing market space. The fast changes in technology provide telcos the opportunity to create new market space if they can identify the trends and target them with the right product and service. There will be no need for the telco to worry about beating the competition because once they have the time-to-market advantage the competition will be irrelevant until they match with similar product and service.

Another important aspect of BOS is focusing on creating and capturing new demand instead of continuing to exploit existing demand. For a long time, telcos have provided a utility phone service for a flat monthly fee. However, with the Internet getting ubiquitous along with all the associated applications and services that are forming the digital economy, there is a great opportunity for telcos to innovate value to customers. The created value will stimulate new demand for the telco that will be far more profitable than exploiting the existing demand (Kim and Mauborgne, 2004).

In order for telcos to innovate value for customers, they have to deliver differentiated products and services cost-effectively. Trying to pursue a cost or differentiation strategy separately would not result in value creation (Kim and Mauborgne, 2004). What plays in the telcos' favor is the continous changes and improvement in technology. The telcom industry is heavily dependent on technology, and if telcos monitor the evolution of technology and identify a value creation opportunity, they can pursue differentiation and low cost simultaneously.

The telecom industry was analyzed in section 3.3. As was illustrated in figure 3.8, the telcos are in a big delimma. The traffic flowing through their network is growing exponentially, but the revenues are saturated and definitely not tracking the tremendous growth in the traffic. This led to an uncaptued value where operators are investing to upgrade their network but they are not able to monetize their investment. Following the approach of BOS, can help telcos fill the traffic-revenue value gap.

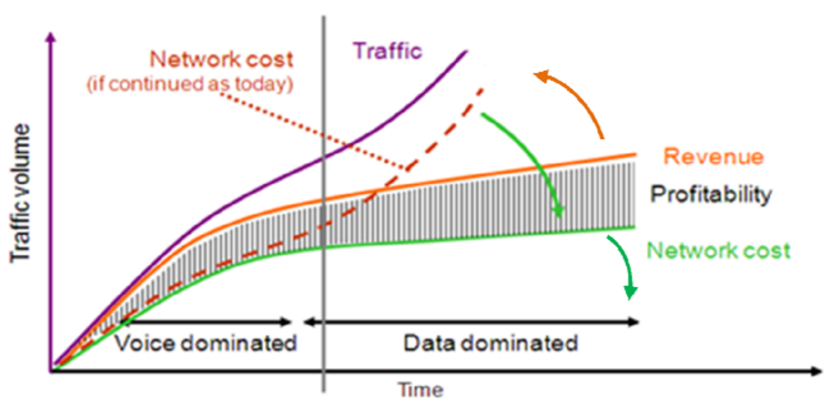


Figure 5.2 Filling the Traffic-Revenue Value Gap

The main interest from BOS comes in the simulataneous pursuit of cost and differentiation. Telcos should not worry much about the exponential growth in traffic and the associated revenues because their focus should be on profitability. As shown in figure

5.2, to maximize profitability, operators need to maximize revenues and minimize cost. But focusing increasing profitability, we find that operators should be more focused on solving the puzzle in figure 5.2 than the one in figure 3.8. Pursuing differentiation in products and services help boost revenues to grow with the Internet traffic growth. Similarly, minimizing unnecessary network investment, and leveraging infrastructure to maximize the products and services that can be supported, will help drop the overall cost.

Other BOS elements that should be very relevant to telcos pertain to how operators deal with the different factors of their product offerings. Creating new factors and raising others above industry’s standards elevates the operator’s differentiation. On the other hand, eliminating some factors and reducing others below industry’s standards reduces the operator’s cost. Increased differentiation and reduced cost leads to value innovation. More details of the applicability of BOS for telcom operators along with an example will be offered in the following sections.

5.3.2 Apple’s Epic Transformation and the Emerging Threat to Telcos

Steve Jobs, the legendary visionary and CEO of Apple, has been credited with the innovation of many great products. These products have arguably revolutionized not only the post-PC electronics, but also the entire music and publishing industries among others. Perhaps the greatest invention of Steve Jobs is none of his products but Apple itself. He was able to transform the company to be an innovation power house that consistently created value to customers and captured most of that value (Hawn, 2004). Their business model innovation has been far more valuable than any technical innovation they have in their products.

Steve Jobs once said: “You can’t just ask customers what they want and then try to give that to them. By the time you get it built, they’ll want something new” (Burlingham and Gendrom, 1989). This gives an indication about the importance of understanding not only trends in the industry but also anticipating what customers value. We can start first by examining Apple’s three main products in the last decade. The iPod was created but MP3 players were already invented. The iPhone was introduced at the time when smart phones where quite common in the marketplace. And the iPad was launched at least 10 years after tablet PCs were first introduced. So where did Apple innovations come from when the main technology behind their main products was already there?

Apple innovations were not merely technology innovation but rather value innovation (Anthony, 2010). Without a doubt, there is a great technology behind the design of their products, but it was the superior understanding of the industry trends, the technology, and the customers' needs and wants that enabled them to create value unmatched by the competition (The Economist, 2007). This resulted in a new market space where competitiors were almost irrelevant and Apple was able to capture most of the value that it had created and delivered (Linden, 2009).

One of the drivers that enabled Apple to capture the value they created is the way they approached the network effects in their products. When they launched the iPod they did not launch it only as hardware like most of other MP3 players available in the market at the time, but rather they launched iTunes which might have revolutionized the music industry. They chose to have a proprietary standard with their iTunes which limited complementary products and services but resulted in a dominate position for iPod in the industry (McIntyre and Subramaniam, 2009). Apple was able to achieve their dominance because they competed with a better business model (Osterwalder and Pigneur, 2010). Although Apple made most of the earnings from selling iPods, but providing customers nicely designed products with the convenience to search and buy digital music has resulted in a superior value proposition for Apple.

When the iPhone was launched, Apple decided to use open standards with its App Store, which encouraged many developers to develop complementary products and services. As of July 2011, the App Store had over 425,000 applications with over 15 billions downloads, and Apple was proud to pay $2.5 Billion to app developers as their share of the profit sharing agreement (Apple, 2011). This is a completely new market space, that Apple was able to create, that provided Apple a significant competitive advantage and was a strong driver for the phenomenal growth that the iPhone and iPad have enjoyed.

Apple has evolved into a platform operator by using a multi-sided business model (Osterwalder and Pigneur, 2010). They started first by introducing iPods, then iPod and iTunes. Next they launched iPhone and App Store. Finally they had the iPad and iBooks. They were able to apply the same model across multiple lines as they keep expanding their business. The strategy used can be a great guidance for telcos as they strive to reinvent themselves. This is especially critical because Apple is now moving into the telcos' space. Apple TV is one of the products that directly compete with one of the key services that telcos are expecting to be a main growth engine (Spira, 2011).

If Apple TV becomes popular it has the potential of destroying the business case for telcos' TV. People will have no reason to pay high fees to their local telcos if they can get similar or better content streamed to their TV sets over the Internet. Although this might take a little time to happen, but the threat is growing. If telcos do not counter attack with similar innovation, they will risk turning their network into a dump pipe that streams the traffic of faster-moving and more innovative companies like Apple.

5.4 BOS Opportunities for Telcos

The previous section highlighted the critical components in BOS that should be part of the new strategy of telcos. It was also mentioned that the fast changes in technology should help telcos in identifying opportunities to innovate value to end customers. In this section, we will list some of the opportunities for telcos based on the emerged trends in the telecom industry. The focus will be on utilizing FTTH technology strategically to gain a competitive advantage.

5.4.1 Deploying FTTH as BOS to Create Opportunities

The telecom industry has become too crowded and it is becoming harder to differentiate between what different companies offer. Utilizing Fiber to the Home technology, as an example, will illustrate how telcos can apply BOS and gain significant competitive advantage in their market space.

FTTH is not a new technology. It had several false starts going back to 1977 and was considered too expensive for mass deployment. It looks like it is finally happening with the several deployments worldwide (Shumate, 2008). Innovations in telecommunications and IT have reached a point where FTTH can not only be deployed cost-effectively, but if it can provide telcos huge advantage if approached with the right strategy. However, when we examine existing deployments, we see more focus on technology innovation instead of value innovation.

In order to translate all the technical and economical advantages of FTTH into a strategic competitive advantage, operators need to focus on value innovation. This enables them to profit from the great potential that FTTH brings. When operators create value for their customers, they end-up with real opportunities (Kim and Mauborgne, 2004). In order for them to do so, several strategic activities need to be considered and implemented, and these activities will be explained in the following sub sections.

The following sub sections will go through the strategic benefits of FTTH and how it can be deployed as BOS, and an example on FTTH deployment will be detailed in the case study about Verizon Networks.

5.4.1.1 Strategic Benefits of FTTH

The FTTH implementation in this study is focused on Passive Optical Network (PON) which has become the technology of choice for most tier-1 telcos. As shown in figure 5.3, optical fiber is used to directly connect the customer network element to the Central Office (CO). The distribution network is completely passive, which means that there is no active equipment that requires to be powered. CO equipment is also shared through the passive optical splitters. Fiber has virtually unlimited bandwidth, and driving fiber all the way to the home enables telcos to support new services and have future-proof solution.

The passive nature of the distribution network makes it more reliable and eliminates the need for power. Also, supporting multiple customers with a single fiber reduces the capital cost per home and significantly reduces the power and space required in each CO. Finally, compared to copper-based solutions, FTTH enables operators to have higher data rates by inserting additional wavelengths to support new customers or existing customers who need the service and willing to pay for it. Eventually the network can be transformed into a pure WDM-PON (Wavelength Division Multiplexing) network where every customer enjoys a virtual point to point connectivity to the central office with a dedicated wavelength (Heavy Reading, 2009) as shown in figure 5.4.

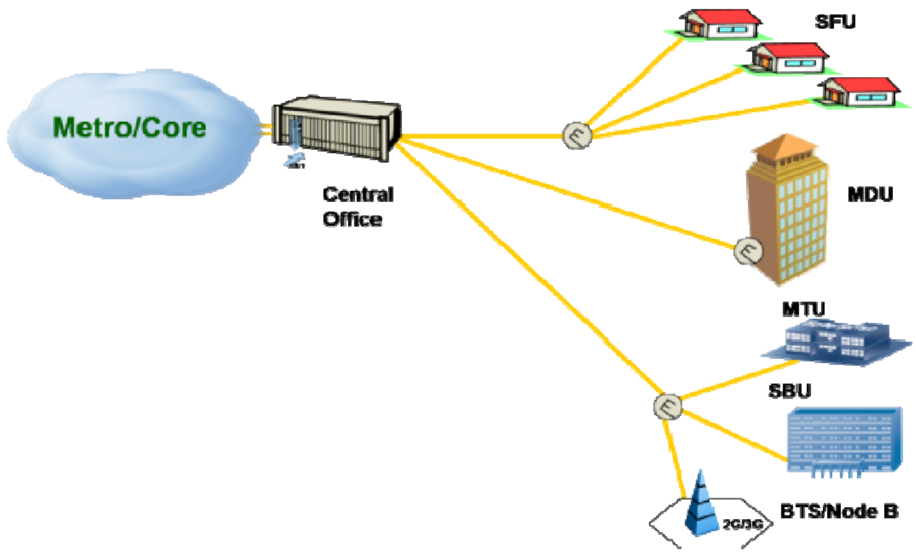


Figure 5.3 FTTH PON Implementation

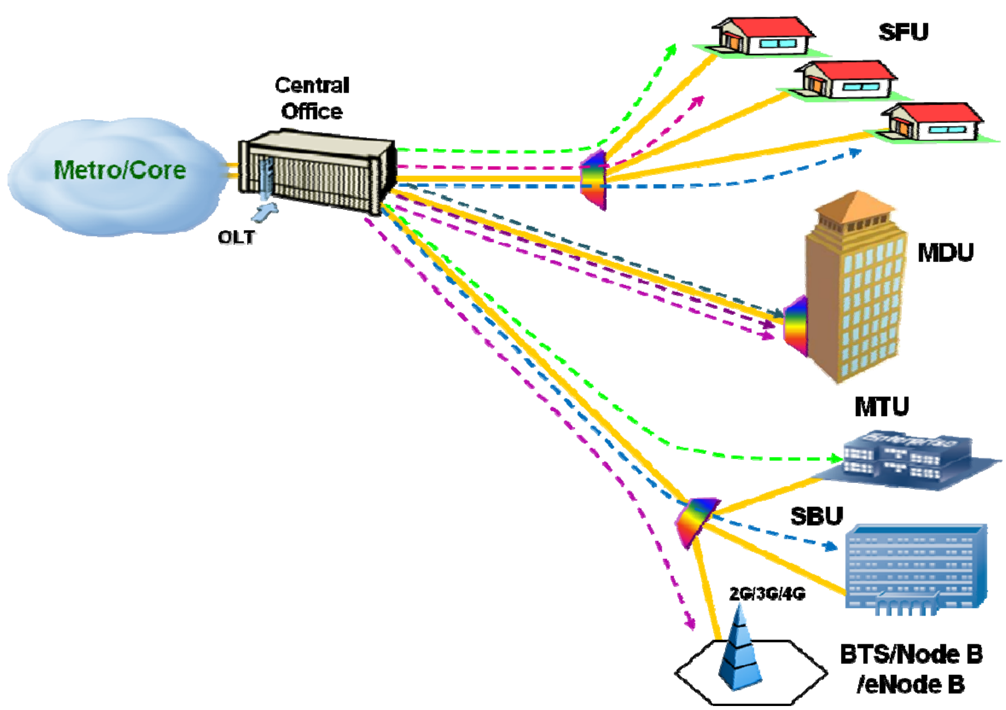


Figure 5.4 FTTH Upgrade with WDM

Changes will be minimal in the distribution network where optical power splitter may be replaced with a colored device, such as AWG (Arrayed Waveguide Grating) to separate the wavelengths without having to change the outside network (Banerjee *et al*, 2005). TDM and WDM networks can co-exist since WDM-PON may use the rest of the optical spectrum (i.e. C-band), which is not used from the previously installed technologies (as in GPON networks that use IPTV instead of video overlay) (Cheng and Effenberger, 2010). This provides a nice upgrade path for current deployment to ensure that it is future-proof and that the return on invested capital is maximized.

More customers per CO, reduces the number of COs needed, and makes the network intelligent to monitor, report, and assist in troubleshooting and fault isolation. An exchange serving 15,000 customers, for example, would require 900 racks of copper equipment and 800 KW of power, while FTTH would only take one rack and 100 W of power (Payne, 2009).

Customers and services can be supported from a single FTTH access platform. Single family units (SFU), multi-dwelling units (MDU), shopping plazas (multi-tenant units MTU), enterprises, and even mobile base stations can all be connected to the same distribution network. They would only differ with the network termination element and the interface required from that element. Current commercial PON technologies are based on a shared TDM/TDMA pipe (Time division multiplexing/ Time division multiple access).

FTTH does not only have technical and financial benefits, but it could also have significant strategic benefits if operators use it not just as a new technology but rather as a platform that enables them to completely transform their business. The following sections will discuss the opportunity for operators to use FTTH to create a significant competitive advantage.

5.4.1.2 Utilizing FTTH to Create New Market Space

Most Operators are no longer monopolistic entities who provide a single utility service in a static market and industry. The business model will have to be completely reshaped to evaluate all the old assumptions and consider the current key competitive drivers (such as customer preference, product quality, price, industry standard, etc). A "strategy canvas" (Kim and Mauborgne, 2004) needs to be created to graphically display these factors. A possible FTTH strategy canvas is shown in figure 5.5.

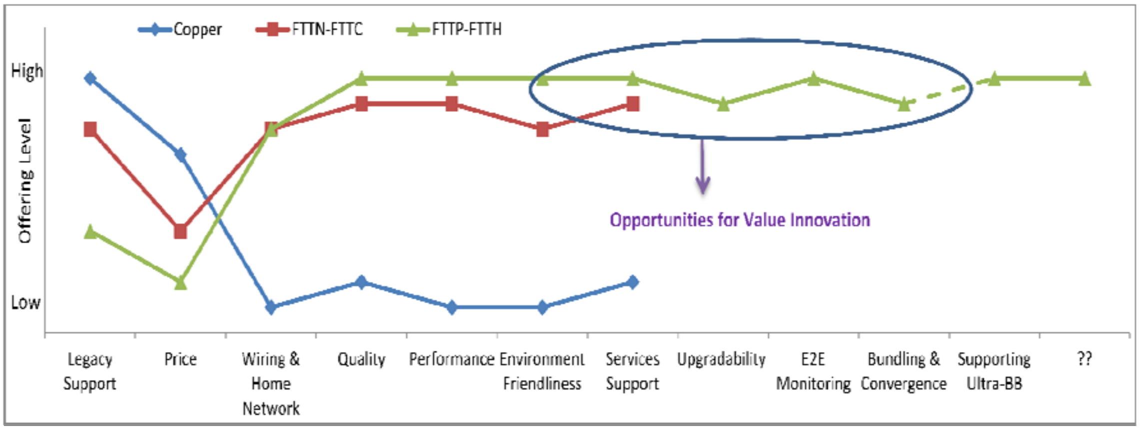


Figure 5.5 FTTH Strategy Canvas

The proposed canvas suggests reducing the legacy services that is supported by FTTH. This can be done by eliminating the old legacy services that do not fit the new FTTH and IP networks. These services, that use legacy interfaces, generate little revenues and these revenues do not support the associated cost in the network to continue to carry them. The offering level on the price will be reduced also, since operators will have to charge customers a little higher price in exchange for the premium service provided from a modernized network.

The proposed canvas suggests raised offering level as it relates to the delivered quality, performance, envinronment friendliness, and the services that can be supported by FTTH. Furthermore, when deploying FTTH, operators can have a future-proof platform that is upgradable and capable of supporting end-to-end monitoring and ultra high-speed broadband Internet access. All access solutions can be converged in one network and services can be bundled in packages and offered on the same network.

When we look at cost, FTTH has a lower CAPEX and OPEX than copper, but the investment required in brown fields, where a legacy network already exists, is very substantial. However, even in brown field applications, the significant OPEX savings will enable operators to still provide comparable prices to what is offered in existing networks (Shumate, 2008; Cochrane, 2008; O'Byrne, 2005). In fact if we factor the OPEX savings only the first 4 years of operations the total cost of ownership (TCO) is estimated to be 37% lower with FTTH (de Saint-Martin, 2010). The real value for customers will come from the quality of service and the ability to get new services that cannot be realized with copper-based solutions.

Telcos need to transform their business model to provide services and solutions instead of getting caught in providing a fatter pipe. This requires a complete change in the mindset of the company. The variety of options and the complexity involved can easily confuse and turn off customers. The best way to retain customers and create opportunities for them and for telcos is to engage with them as a partner and as a solution provider. This is mainly applicable to enterprises and small-medium businesses. Outside providing turnkey solutions, opportunities exist in hosting services, managed services, cloud computing, and other network-based services. Furthermore, pushing network elements inside customers' home-network provide tremendous opportunities to introduce many new services that never existed in the traditional business models.

5.4.1.3 Deploying FTTH for Strategic Reasons

It is very easy to get lost in numbers that may or may not show that FTTH has a valid business model. Business case numbers were analyzed extensively in the past and it was never easy to justify the amount of investment required for FTTH (Frigo et al, 2004). However, when we look at the big picture, we see a completely different view.

As we will see later, when Verizon pursued FTTH for strategic reasons they were pleasantly surprised by the improving economics of their deployment. They were able to travel quickly through the experience curve and benefit from the economies of scale. Verizon focused on the big picture and was able to identify an opportunity that enabled them to create value for their customers and gain a significant competitive advantage.

Another example is Apple who hardly used any market research data as they were preparing for the launch of their new products. The strategic part that is based on in-depth understanding of the trends in the industry and the evolution of the technology could prove to be a lot more valuable than any business case numbers that a company might run.

5.4.1.4 FTTH as an Engine to Create New Demand

Instead of focusing on current customers and services, operators need to use trends they see in the industry to identify possible opportunities. Real growth lies beyond existing demand. It is very important to make sure that today's network can support tomorrow's applications. We have never been good in predicting the future. Nobody predicted the emergence of YouTube and social networking, and no one knows what other applications and products will emerge in the future. An introduction of a new popular device, like the iPhone, could drain the network resources and cause a significant negative publicity for the operator. Telcos need to ensure that their network can be transparently upgraded with minimum interruptions to existing customers. A platform like FTTH has this capability. Once the fiber is in place, additional wavelengths can be added and the traffic can be upgraded without having to change the optical distribution network.

The telecom industry is extremely dynamic and the potential is huge to introduce new products and services, or at a minimum facilitate and stimulate such innovations by having the right platform deployed. A platform like FTTH, not only enables operators to provide access to higher data rates, but it also enables them to build a complete eco-system to provide differentiated services. The possibilities are unlimited and include building management services, smart home solutions, user-generated contents, security solutions, infotainment, telecommuting, e-health, e-education, security, and many personalized and interactive video-based services.

5.4.1.5 Executing the FTTH Strategy

Technological innovation does not necessarily lead to "value innovation". The product usefulness and value need to be assessed to see how customers will buy it and use it. We should determine why customers will buy it and if it brings exceptional utility. In general, customers do not care how their bits are delivered to them. The satisfaction rate for fiber users is extremely high but few of the non-fiber users even know about FTTH (Pesovic, 2009). It will be the task of Marketing to perform mass education of the customers on the benefits of FTTH and continue to introduce innovative services at affordable prices to continue to create value for customers.

Another value to the customer is created by the inherent reliability of the fiber network and the ability to make the network intelligent. Monitoring and diagnostics can be performed at every layer and for every service in the network. Deterioration in the network and degradation in the performance can be detected and problems can be resolved before they become service-affecting. This enables operators to provide unprecedented service quality for their customers to gain their loyalty and retain them for the long term.

The bottom line from venturing in FTTH or any other technology is to improve profitability, for both short and long terms. Cost reduction directly improves the bottom line. As discussed earlier, FTTH enables the operators to reduce the total cost of ownership. At the same time, it helps consolidate the different networks that operators currently run into one converged network. One thing to keep in mind is that operators need to get the most out of their investment and not let the likes of Google "free ride" on their investment while they carry all the risks. The price per bit is dropping every year, and the IP traffic is increasing exponentially but the revenues per the IP traffic is not increasing proportionally. If that gap cannot be narrowed, at least it needs to be kept under control to maximize the benefit from the traffic that runs through the operator's network. Operators should not treat all bits equally, but should rather focus on the profitable ones. Different services require different bit rates and have different quality of service requirement. The focus should be on making the network more intelligent while introducing new profitable services and ensure the quality of experience for these services.

Finally, operators must resolve any internal departmental differences. People will question and resist the new strategy, especially if it affects their position and area of expertise. Implementing a new strategy successfully starts and ends with the employees. With fiber replacing copper and TDM networks getting phased out with services converging to IP, it is important that the skills of the employees keep up with the changes in the technology and the industry. Management should make sure that these internal issues do not affect the overall performance of the organization or impact the quality of the services delivered to customers.

The FTTH strategy should be built into the company's ongoing processes. Since it involves risks, it is important to build trust among the key stakeholders to generate an extra effort from a unified team. Innovation should be embedded in the operator's processes to continue to identify new and innovative products and services that create new opportunities to stay ahead and avoids the red ocean.

5.4.2 Other BOS Opportunities for Telcos

We have shown that FTTH provides the operators a unique platform to pursue both cost and differentiation. Although the focus on this research work has been mostly on the Fixed/wireline segment of the telecom industry, but the principals can directly be applied to the Mobile/Wireless segment.

If we examine the evolution of mobile technology, we find that the Fourth Generation networks (4G) in the form of Long Term Evolution (LTE) provides similar opportunities to the mobile operators. The technology enables telcos to pursue differentiation and low cost simultaneously. The high throughput and low latency enable telcos to provide new services and applications such as real-time interactive gaming, mobile video conference, and HD mobile video (Dahlman, 2008). While the cost is optimized due to the simplified flat IP architecture, high capacity and scalability, deployment on existing sites, and the use of Self Organizing Network (SON) to minimize OPEX (Holma and Toskala, 2009).

Upgrading the network with FTTH or LTE will tremendously strengthen the competitive position of telcos, only when the telcos utilize the right platform to monetize their investment. Both IPTV and Cloud computing require modern network to deliver the services and applications and can help telcos create tremendous value for their customers.

In addition to broadcasting channels, IPTV can be utilized as a platform for delivering on-demand personalized video and web contents to be displayed at any screen in a true convergence of network and devices (Simpson and Greenfield, 2009). There is a tremendous potential for revenues from pay per usage for the different applications that can be provided to customers through IPTV. At the same time, having access to any content from any device with the same look and feel create a great value for customers.

This is especially true if this service is bundled with other telecommunication services in a cost-effective package which can significantly increase the customers’ stickiness and reduce churn.

Cloud computing, on the other hand, can be a perfect value-delivery platform. Once a modern and reliable infrastructure is in place, telcos can deliver old and new application services in a virtualized environment (Sosinsky, 2011). This reduces the complexity for customers and enables them to have a lower cost while having differentiated services. Customers, however, have to trust that telcos will be able to provide a reliable and secure delivery platform for their data.

The utilization of the mentioned four technologies: FTTH, LTE, IPTV, and Cloud Computing, can provide the opportunity to innovate in a blue ocean to create value for customers while avoiding going head to head with the competition.

5.5 Proposed Telcos’ Business Model Based on the Research Study

We have found from the survey in chapter 4 that the main barrier for operators to transform their business is the out-of-date business model that did not keep up with changes in markets and technologies (Survey Q.9). Therefore, after analyzing the findings and highlighting the strategic initiatives that telcos need to implement, the next step is to formulate the business model for future telcos. The business model will describe how telcos will create, capture, and deliver value to customers based on the finding of the research.

As we found from reviewing the theory in chapter 2, the main components of a model is the strategic choices, value network, create value, and capture value (Shafer *et al*, 2005). The new business model should not look backward or evolve around what competitors do, but rather focus on creating value to customers while deriving new revenues and delivering superior customer experience.

A diagram for the proposed business model is illustrated in figure 5.6 based on the findings from the survey. We have found that the biggest threat to telcos comes from OTT companies (Survey Q.3). This is a key consideration in the new business model to make sure that telcos can be most competitive against Internet companies and OTT players who stream contents over the operators' networks. The proposed business model is explained next and the associations between its different elements and the findings of the survey are indicated by the inserting the survey question between two paranthesis after each element.

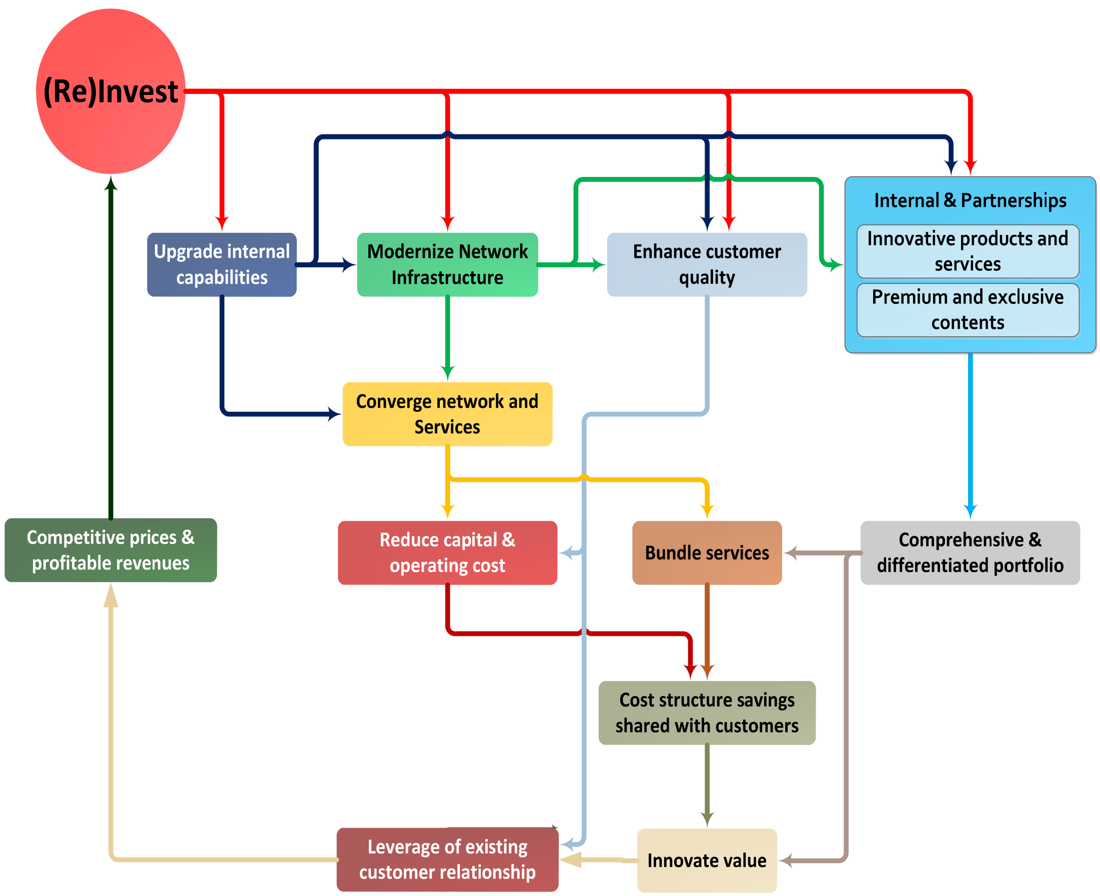


Figure 5.6 Proposed Business Model for Telcos

Telcos have to have ongoing investment in upgrading internal capabilities (Q.9), modernizing the network (Q.10), enhancing the network quality and customer support (Q2), and developing innovative products and services (Q.6, Q.7). Upgrading internal capabilities would help in modernizing the network and converging the network (Q.4). It would also help in terms of enhancing the customer quality and creating a culture of innovation to develop innovative products and services (Q.7).

When the network is modernized, it will have to be designed for maximum convergence which would reduce the CAPEX and OPEX (Q.5). At the same time, a modern network will enable the telco to carry new and innovative services that would meet not only current applications but also future ones (Q.6). The convergence also enables telcos to start bundling services in packages to offer them to customers at competitive prices comparing to what competitors offer (Q.5, Q.7).

A critical part of the telcos' future model is offering customers a comprehensive portfolio of differentiated products and services (Q.7, Q.10). The differentiation would come from either offering customers innovative products and services (Q.7), or providing customers access to exclusive and premium contents (Q.8). Some of the content, products, and services can be developed internally by the telco (Q.6, Q.7), the rest will have to be provided through collaborations and partnerships (Q.8). The differentiated products and services will be bundled along the other telecom basic services to provide customers comprehensive packages at competitive prices (Q.7, Q10).

The savings that telcos can get from improving the quality of their network and services along with the CAPEX/OPEX savings they get from convergence translate into a lower overall cost structure (Q.10). When these savings are shared with customers along with differentiated services offered in competitively priced bundles, a value will be created (Kim and Mauborgne, 2005). The telco will be in a position to capture this value. The telcos can leverage of the existing billing relationship they already have with the customers (Q.1) to offer their bundled packages of differentiated products and services (Q.5).

If the quality of the network is improved and the customers are already happy with their local provider, it is less likely that they would churn to an Internet company that has no local physical presence (Zorn *et al*, 2010). This is a significant competitive advantage that would enable the telco to not only retain their customers and prevent churn, but even offer future products and services building on the existing relationship (Q.1). This would all translate into generating more revenues due to the low churn and the additional revenues from the new contents, products, and services (Jahromi *et al*, 2010).

The profitability will be maximized in the model since the cost structure is minimized in the improved quality and the operation of the converged network. The profit would be looped back in the model to be used in reinvesting in additional innovative products and services, and the other investment areas. The cycle enables the telco to continue to innovate in the infrastructure, the product/services, and the value delivered to customers. If telcos fail to continue to invest, the competitive advantage they would get initially will not be sustainable as competitors will catch up (Kim and Mauborgne, 2005).

Since the model requires significant amount of investment and telcos cannot afford to wait long to transform their business, they will have to rely more on open innovations and on collaborations and partnerships (Chesbrough, 2007). Telcos should utilize the new trends in having an open business model that aims to create and capture value through systematic collaboration with outside partners (Osterwalder and Pigneur, 2010). This stimulates innovation within the company and creates a cross-pollination environment that benefits all involved parties. Additionally, arrangements, such as revenue sharing, can be mutually benefitial. These arrangements create new revenue opportunities to the partners and improve their economies of scale as they sell to more telcos and penetrate new markets using the local knowledge and customer relationship of the telco. The telco, on the other hand, will benefit in terms of minimizing risk, preserving cash, and eliminating the need of upfront investment.

5.6 Case Study: Verizon Communications

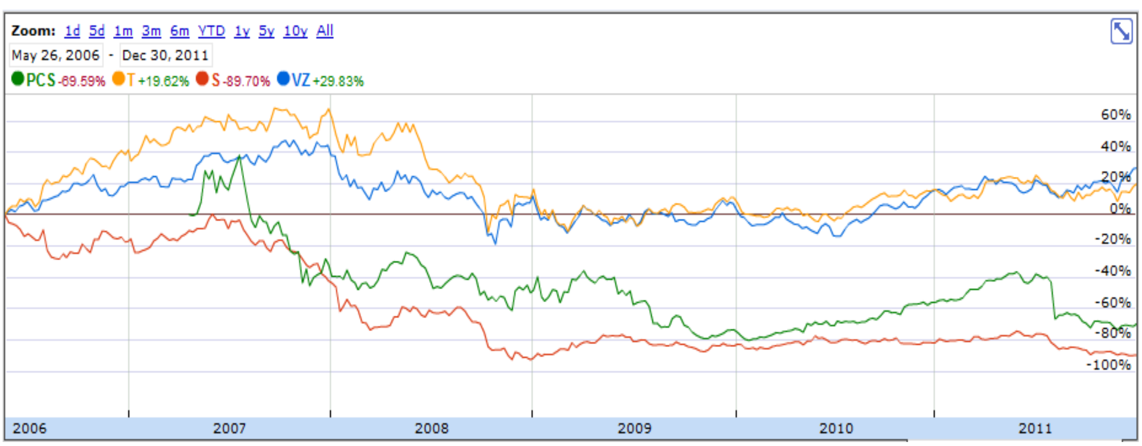
Several telcos were examined to see how they have been responding to the challenges that were listed in the research study of chapter 4. It was found that Verizon Communications, an operator in North America, has been far more successful in responding to challenges than other operators. Verizon was able to completely transform their business in response to the competitive pressure they faced, and they seem to be on the right track in modernizing not only their network but also their entire business model.

The focus in this case study is on the wireline business of Verizon Communications and how they utilized FTTH to revolutionize their value proposition.

5.6.1 Who is Verizon?

Verizon Communications (Verizon) is one of the world's leading providers of communications services. They provide wireless voice and data services in the United States and have a wireline business that provides voice, data, and video services, network access, long distance and other communication products and services. Verizon also owns and operates one of the most advanced Internet Protocol (IP) networks and has 222,900 employees (Verizon Annual Report, 2010).

Verizon was formed as the merger of Bell Atlantic and GTE on June 30th, 2000. However, there were many mergers involved that included companies with history dating back to the 19th century (The History of Corporate, 2011). Furthermore, the wireless joint venture between Bell Atlantic and Vodafone was branded as Verizon Wireless, and Verizon also acquired MCI and branded that division as Verizon Business. This resulted in one of the biggest telecommunications companies with \$7.4B in profit, \$75.1B in sales, and \$168.1B in assets (The History of Corporate, 2011).

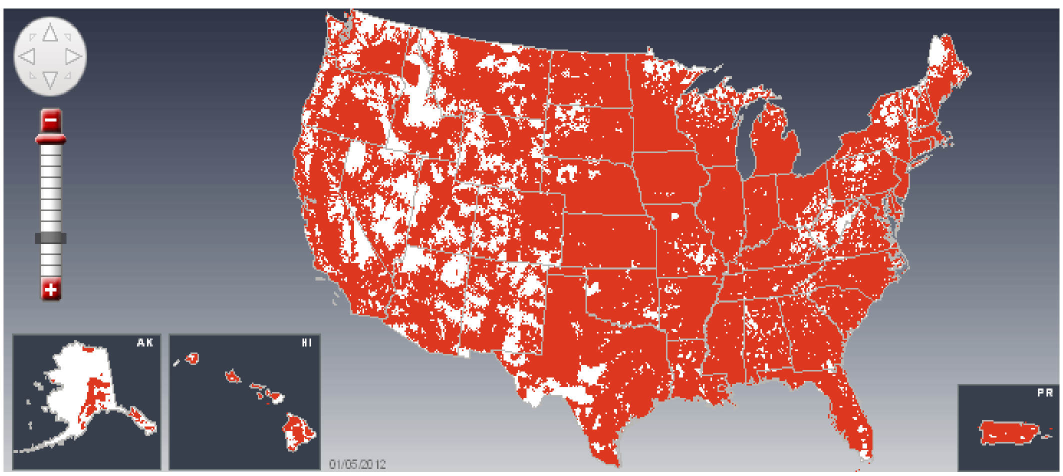


Source: Google, 2011b

Figure 5.7 Financial Performance Comparison between Verizon (VZ) and its Main Competitors: MetroPCS (PCS), AT&T (T), and Sprint (S)

The company is currently headquartered in New York. It has a market cap of $113B, sales of $109B, and ROI of 10.37 compared to 5.5 in the industry and 6.8 in the sector (Reuters, 2011). The main competitors of Verizon in terms of market share are AT&T, Sprint/Next, and Metro PCS (CITI, 2011). However, as we can see from the stock performance chart in figure 5.7, Verizon was able to outperform the competitors in the last 5 years (Google, 2011b).

Verizon has different geographical coverage for its main three businesses. Verzizon business focuses on enterprise customers who can be reached globally through the Verizon global business network. Verizon Wireless is focused on providing wireless services to consumer and businesses with nationwide coverage in the entire United States as shown in figure 5.8 (Verizon Wireless, 2011).

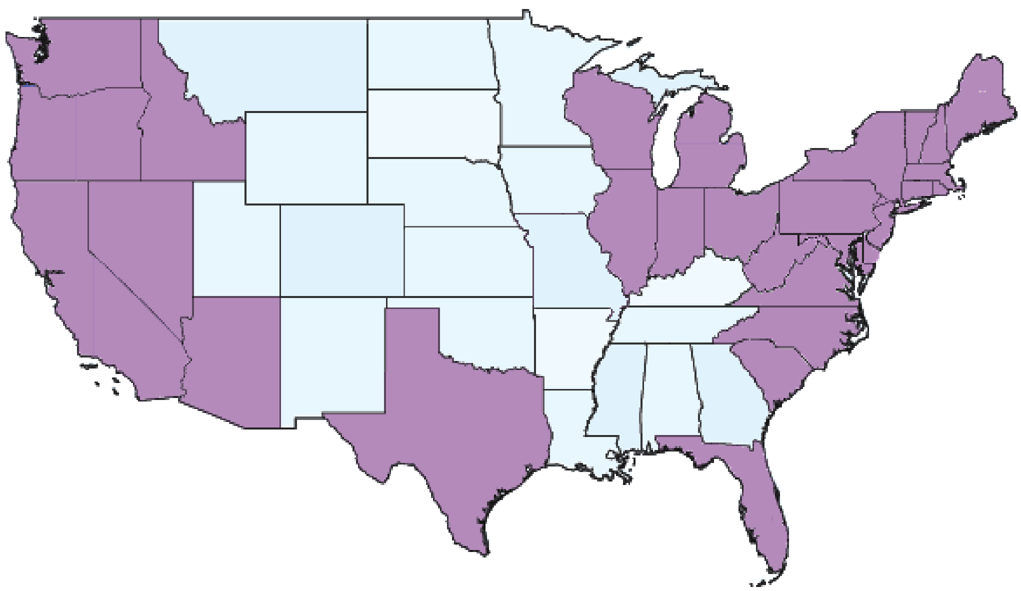


Source: Verizon Wireless, 2011

Figure 5.8 Verizon Wireless Network Coverage Map

The Verizon wireline business, however, is limited to the states where Verizon has a wireline license. The states are shown in dark purple in figure 5.9 (Verizon Map, 2011).

In order for Verizon to cater for the diverse requirements of its wireless and wireline, residential and business customers, it partnered with worldwide lead suppliers. The suppliers enabled Verizon to introduce lead-technologies in the network to provide customers advanced services with high quality. Lead telecom vendors, such as Alcatel-Lucent, Nokia-Siemens, and ADC Telecommunications, provided Verizon with solutions for networking gear, communication cables, test equipment, and network elements (Verizon West, 2011; Verizon East, 2011). As we will see later, the Verizon supply chain was not limited to traditional telecom vendors, but it expanded later on to include content providers and some OTT companies, such as Skype (Verizon, 2010). These types of alliances enabled Verizon to enhance its product portfolio to competitively position itself as a total telecommunication solution provider for all telecom customers.



Source: Verizon Map, 2011

Figure 5.9 Verizon Wireline Network Map

Verizon has been covered in the literature. However, most of the literature was industrial and commercial and not academic or scientific. Furthermore, the discussion in the literature was focusing on one strategy or investment decision by Verizon. There was no study examining the entire transformation in the network and the business of Verizon since it was founded as a merged company between Bell Atlantic and GTE.

The series of mergers that resulted in Verizon as it is today was discussed in the literature. The original merger between Bell Atlantic and GTE enabled both companies to build a strong brand over larger geographical area with bigger client base and wide array of products and services (Sbeit, 2008). The take-over of MCI that was added as Verizon Business was the competitive reaction to the main competitor of Verizon at the time, SBC, which acquired AT&T and used the strong AT&T brand for the combined company (Sastry, 2009).

The MCI acquisition enabled Verizon to diversify in business, further enhance the brand value, increase the client base, cut down on expenses for backhauling traffic in the transport network, and penetrate the international clients due to the global reach of the MCI network (Tardiff, 2007). Verizon later added other acquisitions, most notably the one with Alltel. That merger enabled Verizon to increase its infrastructure and market share while having more licensing options (O'Brien and LaFerney, 2009).

	Strengths – S 1. Reliable/Robust Wireless Network 2. Strong financial performance 3. Corporate Strategy 4. Brand awareness	Weakness – W 1. CDMA Technology 2. Declining access lines 3. Geographic concentration 4. TV
Opportunities – O 1. Price reduction 2. Reduced debt load 3. Cost Structure 4. Demand for accessibility for wireless applications	SO 1. Provide high speed communication tool (S1, S3, O4) 2. Due to price reduction, the company can gain new customers and keep attracting old ones (S4, S3, O1)	WO 1. Large amount of investment on global market expansion (O2, W3) 2. Cut down the funding on unprofitable division and use it on growing (W2, O4)
Threats – T 1. Technology change 2. Regulatory framework 3. Intense competition 4. Competitor's adaptation of Verizon core competency 5. GSM	ST 1. Relatively high price setting (S1, T3) 2. Investment in R&D to keep up with future technological change (T1, S2)	WT 1. AT&T, competition, regulatory (T2, T3, W3) 2. GSM/CDMA

Source: Adapted from Phillips, 2008

Table 5.1 Strengths, Weaknesses, Opportunities, and Threats of Verizon

The Verizon FTTH deployment was reviewed in the literature and despite the negative early reaction by investors it was viewed later as a very forward looking move (Wharton, 2007). Verizon has continued to evolve with the technology. Even when they missed one innovation cycle, they tried to lead the next through superior offering (Kanter, 2011). For example, when AT&T was struggling with quality issues due to the overwhelming traffic from the iPhone, Verizon continued to improve the mobile network coverage and quality. They ended up offering the iPhone later but with better quality network and long with many other Android-based smart phones (Kanter, 2011). This enabled Verizon to offer superior customer experience as they prepared to build the 4th generation LTE mobile network.

The strengths, weaknesses, opportunities, and threats were investigated by Phillips (2008), and are shown in Table 5.1. Based on the analysis, Phillips recommended that Verizon pursue 4G/LTE technology, expand FTTH nationally with increased speed and quality, and increase investment in R&D (Phillips, 2008).

From reviewing the different literature that analyzed Verizon, especially the past 3 to 5 years, it can be concluded that Verizon has successfully evolved form a U.S.-based carrier to a competitive global telco. This was a direct result of the wise decisions Verizon made in investing capital and resources combined with valuable acquisitions and systematic staff transformation (Chamberlin et al, 2011).

5.6.2 Drivers for Change

The wireline business of Verizon has been under a tremendous competitive pressure from cable companies, mostly in the Northeast states of the US (Verizon, 2004). That area is very populous and the Verizon network, which was mainly based on copper, was not delivering the right performance and quality to enable Verizon to compete effectively with cable companies. As a result, Verizon customers were churning to the cable competitors.

As the demand for bandwidth was growing in the late 1990s and early 2000s, most telcos were still fully committed to their existing copper infrastructure citing its cost-effectiveness and the lack of maturity of deep-fiber solutions. Incremental enhancement in technologies enabled these telcos to continue offering higher speeds while still using copper. These telcos became even less committed to new technologies after the burst of the Internet bubble as R&D activities are usually the first to be cut in any economical downturn.

Unlike other telcos, Verizon realized that copper does not have the longevity required to effectively compete long-term, and that a copper-based infrastructure would prohibit Verizon from evolving with changes in the technology (Belson, 2004). Therefore, Verizon has made the decision to invest in fiber optic networks in a nation-wide FTTH build out. Verizon did not present their new innovation to customers as a technology but rather as an experience. The experience started with the brand and expanded to cover the entire business operation associated with the deployment.

5.6.3 Transforming Verizon's Network and Services

If we take the case of Verizon, they chose to deploy FTTH, branded as FiOS, for strategic reasons due to the fierce competition from their cable rivals (Verizon, 2004). That was the largest project in the company's history, and Wall Street punished Verizon for taking that risk (Wharton, 2007). However, not only Verizon was able to benefit strategically by getting into a blue ocean away from their cable rivals, but the economics of the business case were improving quickly as the company travelled through the experience curve and the technology matured.

Verizon did not stop at upgrading the wirleline network infrastructure, but they simultaneousely pursued offering differentiated products and services to monetize their network investment. If they had just upgraded their network to offer faster Internet access speeds, they would have risked being a dump pipe where OTT companies would be benifiting the most of that investment. Their approach was to offer triple play services (voice, video, and data) as soon as the infrastructure is built. So it was important that they invest in the platform to provide video since the video service was new to them (Breznick, 2005). The platform was not just limited to broadcast video but was developed to offer more interactive video services that can generate new revenue streams on a Pay per Usage (PPU) basis.

Verizon also worked with carefully selected partners on an Application Platoform and an App Store. Customers were enabled to download applications from multiple devices while accessing the same platform. Exent Technologies partnership resulted in Verizon Games on Demand, and Oberon Media partnership resulted in providing customers downloadable games through the Verizon Arcade (Burstyn, 2008). Other examples include ESPN360 (live games and highlights), Rhapsody (music downloads), Movies.com, and many others.

One of the most interesting partnerships that Verizon made was with Skype (Verizon, 2010). Although the agreement is targeted for smartphones, it demonstrates a shift in the mindset of telcos. Verizon has been a strong telephone companies for long time and they knew that time has changed and Internet telephony has become too popular to ignore. This was a very courageous move from Verizon to embrace the change in technology in their pursuit to transform their network and business model.

Verizon's innovative development coupled with its partnership strategy enabled it to have best in class portfolio of products and services. Some of these services are (Kishore, 2009):

- Comprehensive HD-Rich Content Delivery: over 600 digital and HD channels, over 14,000 VoD titles including HD, movies, PPV, games, etc

- Interactive Media Guide: the network low latency translates into fast response for interactive services. The guide has network powered global content search with advanced graphical interface and intuitive navigation.

- Whole-Hole Multimedia: multi-room DVR, bundled software applications for sharing photos and music files.

- Widgets: a real-time on-demand interactive and customized applications that provide customers access to local weather, traffic conditions, local news, and popular shows and movies in the local area.

- Converged Content Control: Internet-based remote control of the home DVR STB (Set-Top-Box) to view, browse, search, and record TV contents.

To differentiate their services and applications from what customers might be able to get at lower prices over the Internet, Verizon made sure that their network is designed and optimized and provide the best possible QoS and QoE. To facilitate that, Verizon invested in what they called VDMS or Verizon Digital Media Service, which is a combination of Content Delivery Network (CDN) and Cloud Computing (Cudmore, 2011). This enables Verizon to cache content to place them as close as possible to customers to deliver the best performance to customers. Furthermore, it provides Verizon the ability to bring content to all the devices that the customer has connected to the Verizon's wireline and wireless networks. A general diagram of Verizon VDMS is shown in figure 5.10 (Verizon, 2011).

Figure 5.10 Verizon Digital Media Services (Verizon 2011)

The fourth generation of mobile networks can benefit greatly from VDMS due to the need to deliver media-rich content to mobile handsets with minimal delay. This is a new market space where no other telco has ventured before and it is expected to create a tremendous value for customers. Verizon has taken the lead in the industry and has to work with multiple partners to make it happen, but being first to market in this new space can be a significant competitive advantage to Verizon.

5.6.4 Transforming Verizon's Wireline Business Model

In their pursuit to offer differentiated services, Verizon did not rely on innovating technologies but rather on innovating value. For example, they chose to offer TV services through video overlay, which is a mature technology similar to what cable companies use to deliver their video service to cable customers. Verizon did not follow the latest technology innovation but rather preferred to utilize a technology that enables them to innovate the most value. The video overlay technology was mature enough and it enabled them to start competing immediately with their cable competitors and offer their customers a better value proposition.

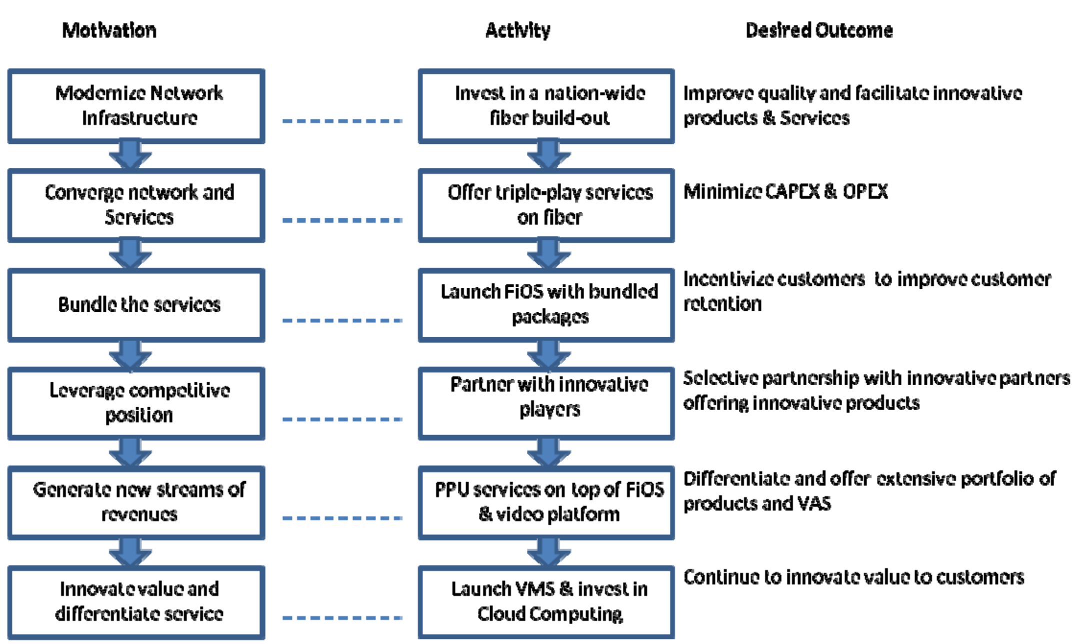


Figure 5.11 Sequence of Verizon's Wireline Business Transformation

The transformation of the Verizon's wireline business is summarized in figure 5.11. The modernization of the Verizon's network through a nation-wide fiber build-out has enabled Verizon to significantly improve the quality of service they provide to their customers. This translated into a high customer satisfaction. FTTH has enabled Verizon to converge all services on one network which translated into savings in both CAPEX and OPEX as only one network needs to be built and operated. These savings enabled Verizon to have lower cost structure and pass some of the savings to customers in terms of pricing the services competitively.

After laying down the right infrastructure, Verizon was able to provide triple play services (voice, video, and data) in bundled packages. Bundling the services enabled Verizon to upsell customers to increase revenues, and increase customer loyalty and retention. Verizon understood that the infrastructure they built enabled them to provide some truly differentiated services, but they could not become a one stop shop for all services and applications alone. This is due to time to market involved in developing all the necessary applications, and also due to the popularity of existing applications from well established innovative players in the industry. Therefore, Verizon decided to engage in partnerships as a competitive strategy to enhance their portfolio of products and services over their FiOS brand.

The partnerships that Verizon pursued along with their own internal development enabled them to continue to introduce more services and applications on a PPU basis. This is also a significant shift from the tiered pricing that is based on network usage for a flat monthly fee. Finally, Verizon existing work with VDMS, CDN, and Cloud Computing will enable them to continue to create value for their customers and be in a position to capture that value. These investments enable Verizon to offer innovative and differentiated products and services while having a cost leadership position in the marketplace.

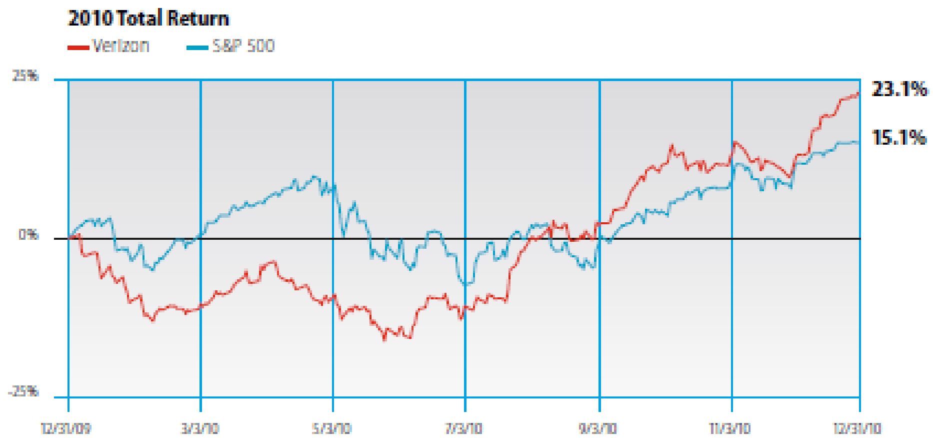
5.6.5 Outcome of the Verizon Wireline Transformation

Although Verizon felt that strategically they had to go to FTTH regardless of what the business case numbers said, they ended up with significant savings in OPEX, a big boost in revenues, and top customer satisfaction rate. The company started enjoying a drop of 80% in the network report rate and the dispatching calls. The cost per home passed dropped from $1,400 in 2004 to $700 in 2009, and the cost per home connected dropped from $1,200 to $640 during the same time period (Verizon, 2010). Revenues from FiOS had a 56% growth rate in 2009 and the FiOS ARPU (average revenue per user) exceeded $140, the company received top rankings in surveys for customer satisfaction.

The strategy of Verizon in transforming their network and business has enabled them to reverse the direction of the business from declining revenues to having a healthy growth. As of July 2011, Verizon has reported the followings (Shammo, 2011):

- A 20.7% Y/Y Growth in FiOS revenues
- $146 FiOS ARPU
- 3.8M FiOS TV subscribers with 184,000 of net additions of subscribers and 30% market penetration
- 4.5M FiOS Internet subscribers with 189,000 net additions of subscribers and 34% market penetration

The portfolio of services Verizon offers still does not fully use the potential of the FTTH network, but it is considered superior to what their competitors offer and it made the competition irrelevant. The decision to invest in FTTH along with the process illustrated in figure 5.11 enabled Verizon to create a new market space away from the head-to-head competition that was bleeding the company resources. Verizon still has a lot to do in their transformation process to be an innovative company in a position to strongly face the threat from OTT companies, but they appear to be on the right track and far ahead of other telcos.



Source: Verizon Annual Report, 2010

Figure 5.12 Total Return in 2010 for Verizon and S&P 500

Verizon is a big company and the landline business is one of three businesses, but it contributes significantly to the overall performance of the company. If we examine the recent performance of Verizon we find that it outperformed not only the main competitors but even the S&P500 index (Verizon Annual Report, 2010). A comparison for the 2010 total return is shown in figure 5.11.

Verizon was a traditional telco that faced the same challenges that all telcos have faced. Legacy network, major shifts in technology, unfavorable regulatory environment, and the emergence of new types of competition. It was the vision of the Verizon management that enabled the company to successfully transform its network and business to turn threats into opportunities.

5.7 Summary

The increased competition in the Telecom industry and the declining fixed telephony revenues are forcing telcos to look for new opportunities to compensate for lost revenues and to capitalize on the fast growth in the IP traffic.

The chapter has proposed a business model and a strategy for telcos based on the findings of the research survey in chapter 4 and also based on some of the teachings in

BOS. The focus was on leveraging the telcos' strengths and building the business model around delivering innovative products and services that create value for their customers. To compete effectively with the growing threat of Internet companies and OTT players, telcos need to leverage their network infrastructure and the existing relationship they have with customers. They will also have to converge their network to lower their cost structure and bundle services and applications to create a value to their customers. Furthermore, telcos need to selectively partner with innovative companies to provide customers creative solutions and premium and exclusive content.

FTTH was provided as an example on how telcos can use technology strategically to deliver low cost and differentiated services simulataneousely. Finally, the chapter discussed in a case study how Verizon Communications is in the process of transforming their network and business in response to the challenges they are facing. Verizon was able to modernize its network and improve the quality of the network and customer experience while boosting the revenues through innovative solutions and valuable partnerships. The end result was a higher value to customers and better return to shareholders.

Chapter 6

Conclusion

6.1 Summary and Conclusions

This thesis has researched the strategy that telcos need to implement to adapt to the changes in technology and the industry and enhance the future competitiveness potential. The main objective was to recognize and classify the existing challenges and the potential opportunities for telcos which drove identifying all the strategic elements in the future business model for telcos. The research work has relied on the statistical analysis for the findings of a research survey conducted globally with experts in the telecom industry.

The research work started by reviewing, in chapter 2, the relevant literature on strategy and strategic management. This literature made the theoretical foundation for the work carried in the thesis. Industry structure and Porter's forces of competition were reviewed. We found that a company needs to identify a unique and valuable position to gain a competitive advantage within its industry. We also found that it is very important for the company to position itself strategically within the industry value chain, which will be determined by the operating business model. Elements in blue ocean strategy and open innovation can significantly enhance the strategic position of the company by pursuing low cost and differention simultaneously.

Before pursuing with identifying the right strategy and business model for the telco, it was necessary to research the currently status of the industry. Chapter 3 investigated the evolution of the telecom industry and the telecom value chain. The forces of competition on telcos were presented along with the current competitive status of telcos given the changes in the regulatory environment and the evolution of technology.

Trends in the telecom industry were investigated and reported also in chapter 3. It was important to identify these trends as they would turn into threats or opportunities. Therefore, it is critical for operators to recognize these trends as early as possible to position themselves in the most favorable competitive position. We have found that Internet traffic continues not only to grow exponentially, but the growth rate keeps accelerating, and telcos need to prepare their network to get flooded by Internet traffic. The industry is leaning towards interactivity, personalization, and sharing, and services are getting centralized and virtualizatized. Services and networks are also moving towards convergence at every level of the network. Perhaps the most threatening trend to telcos is the dwindling entry barrier. Telcos are no longer protected by their geographical location or priviliaged by owning the physical infrastructure. Both sources of competitive advantage have been neutralized by the deregulation of the telcom industry, the unbundling rules to open the network to competition, and the proliferation of the Internet.

The status and trends in the telecom industry set the stage in chapter 4 to design a survey that researched all the strategic elements in the future business model of telcos. The survey was conducted with 122 telecom professionals in different positions, and representing different companies in the telecom value chain and different regions in the world. The survey found that OTT companies pose the highest threat on telcos and that outdated business model and internal resistance within the organization are the biggest barriers to the future of telcos. The survey outcome highlighted the importance of upgrading the network and investing in differentiated services with the help of partnerships with content providers and even the OTT companies themselves. Statistical analysis has found that OTT companies were considered a bigger threat to participants who worked for an operator and those who were executives. The threat of OTT companies varied in different parts of the world due to differences in cultures, regulatory environments, and availability of alternative and localized products.

The research study found that in order for telcos to compete effectively, especially against OTT companies, they have to focus on continouse innovations in new products, improve service quality, and converge the network and services to lower the overall cost structure. This enables the operators to be competitive on price and get better loyalty from their customers. Furthermore, enhancing the product portfolio through partnerships and leveraging the customer relationship through bundled products can make telcos even more competitive.

In chapter 5, and based on further analysis of the findings of the research survey, we have found that applying the teachings of blue ocean strategy is the most appropriate strategy for telcos. Apple was used as an example on how a company was able to successfully create new demand through innovative products and competitive prices which led to the creation of a value to customers. Taken the main elements of the blue ocean strategy and based on the outcome of the research survey, a new business model was proposed. The focus of the business model was to leverage the existing strengths of telcos in terms of owning the network and having an existing customer relationship to deliver innovative products and services that create value for customers.

A study was presented on how telcos can apply the blue ocean strategy on a new technology, and fiber to the home technology was investigated in the study. A case study was also discussed in the chapter investigating how Verizon Communications was able to transform their network and business in response to the challenges and competitive threats they were facing. The process followed by Verizon had a very good similarity to several of the elements in the proposed business model, which lead us to believe that Verizon is on the right track to reinvent the company. The outcome of the Verizon’s transformation has been exceptional in terms of increase in revenues per customer, customer satisfaction, and the overall return for shareholders.

6.1 Directions for Future Work

The research conducted and reported in this thesis has touched on a very broad, dynamic, and challenging topic. There are some elements that are applicable to every industry in terms of the importance of companies to continue to monitor the external environment and adapt accordingly to continue to be in the most competitive position. But there are other elements that are specific to the telecom industry in terms of the vast evolution of technology and the cyclical nature of the industry. This makes it even more challenging for management in telecom companies to formulate the right strategy. There are also additional elements specific to telcos in terms of the regulatory environment and the deregulation mandates, and the threat of the Internet traffic in terms of flooding the network while capturing customers through lower cost and more innovative products and services. All these challenges present a rich environment for research to find how they can be turned into opportunities and how the long-term competitiveness of telecom companies can be enhanced.

The following topics are suggested for subsequent follow-up research, which would be very valuable to telcos and the telecom industry:

- The analysis of the research survey reported in chapter 4 has focused on the threat of OTT companies and how to respond to that threat. But further analysis can be performed on the survey raw data to have detailed analysis on differences in different parts of the world in terms of priorities and challenges and how they relate to the regulatory environment in each country. This can lead into predicting the potential competitiveness and profitability of telcos as a function of the regulatory mandates. A possible contribution there would be to research how regulators can respond in each region to promote competition without killing innovation, and how to assure telcos that their investment can still be protected so they are encouraged to invest further in modern infrastructure.

- Another area along the same line is researching the advantages and disadvantages of Net Neutrality on the future of telcos and the business model of both telcos and over-the-top players. The thesis has barely touched on the topic, but this is a very big topic with significant ramifications on the competitiveness of telcos and the entire telecom industry.

- The research of the thesis was mostly focused on the wireline business to keep the research work focused. The research work can be further extended to the mobile/wireless business which is also becoming very competitive since mobile licenses are very attractive to domestic and international companies and the time to market in launching a mobile network can be very quick. Mobile Virtual Network Operators (MVNO) can make the mobile industry even more competitive. Mobile operators will also face the same challenges faced by fixed operators due to the proliferation of smart phones, like iPhone and Android-based phones. More customers are now using their smart phones or tablets to access the Internet through Mobile Broadband (MBB), and they are becoming an attractive target to OTT companies, like Apple, Skyle, and Google.

- The proposed business model may be further developed by using Structural Equation Modeling in an attempt to have a mathematical representation for the model.

- Finally, another area that can be investigated is researching different business models followed by different operators with complete analysis of the pros and cons for each one and the correlation with any theoretical background.

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Appendix I - Survey Raw Data

Question 1:

Please rank the following assets based on their value to the future of a wireline operator					
Answer Options	Most Valuable	Valuable	Less Valuable	Least Valuable	Response Count
Existing relationship with customers	56	25	24	17	122
Owning the physical network infrastructure	22	30	37	33	122
Financial strength and the ability to bundle services	24	38	38	22	122
Reputation, experience, and telecom's "know-how"	20	29	23	50	122
				answered question	122
				skipped question	0

Question 2:

Please rank the following internal issues based on their urgency to a wireline operator					
Answer Options	Most Urgent	Urgent	Less Urgent	Least Urgent	Response Count
Outdated network in need of major upgrades	30	34	36	22	122
Low quality of service and bad customer support	63	29	17	13	122
Expensive telecom services and tight budget spendings	9	27	41	45	122
Limited, rigid, and closed portfolio of services that lacks creativity and innovation	20	32	28	42	122
				answered question	122
				skipped question	0

Question 3:

Please rank the following type of companies in terms of their threat to the future of wireline operators					
Answer Options	Highest Threat	High Threat	Less Threat	Least Threat	Response Count
a. Other telcos attacking the incumbent's network through open access	31	39	39	13	122
b. Cable, Satellite, and Wireless companies	41	49	27	5	122
c. Equipment vendors/system integrators, builders, and municipalities	2	12	30	78	122
d. Companies who better understand the Internet (such as Facebook, Google, Skype, and Apple)	48	22	26	26	122
				answered question	122
				skipped question	0

Question 4:

Please rank the following services in terms of their revenue potential					
Answer Options	Highest Potential	High Potential	Less Potential	Least Potential	Response Count
Business services, cloud computing, managed services, SLAs	64	29	25	4	122
Ultra high speed Internet access	18	33	36	35	122
New revenues based on contents, applications, ads, and pay per usage	32	42	32	16	122
Smart home solutions and building management systems	8	18	29	67	122
				answered question	122
				skipped question	0

Question 5:

Please rank the following options in terms of their effectiveness in leveraging the wireline operator's assets					
Answer Options	Most Effective	Effective	Less Effective	Least Effective	Response Count
a. Invest in the network to differentiate own services from the competition	52	29	16	25	122
b. Use billing relationship to introduce new services and offer billing as a service to 3rd parties (billing as an application)	17	23	31	51	122
c. Generate revenues from Wholesale by providing open access to 3rd parties	14	29	53	26	122
d. Converge network and services to reduce the cost base	39	41	22	20	122
				answered question	122
				skipped question	0

Question 6:

Please rank the network investment priorities for a wireline telecom operator					
Answer Options	Highest Priority	High Priority	Low Priority	Lowest Priority	Response Count
a. Access Networks	55	27	24	16	122
b. Core Networks	19	36	35	32	122
c. Services and Applications	42	33	35	12	122
d. QoS, monitoring, and Control Policy	6	26	28	62	122
				answered question	115
				skipped question	0

Question 7:

Please rank the following initiatives in terms of effectiveness against the competition for a wireline operator					
Answer Options	Most Effective	More Effective	Less Effective	Least Effective	Response Count
a. Strategic collaborations and partnerships	28	31	46	17	122
b. Effective regulatory lobbying for favorable regulations on Open Access, Net Neutrality, etc.	15	12	27	68	122
c. Continuous investment in innovative products and services	52	34	28	8	122
d. Focus on bundling services to offer customers competitive prices	27	45	21	29	122
				answered question	122
				skipped question	0

Question 8:

Please rank the following possible partners in terms of their value to the future of wireline operators					
Answer Options	Most Valuable	More Valuable	Less Valuable	Least Valuable	Response Count
a. System vendors/integrators, builders, and municipalities	31	17	42	32	122
b. Other operators in wholesale and interconnection agreements	15	22	42	43	122
c. Content providers and application developers	45	44	23	10	122
d. Net companies like Skype, Facebook, Apple, and Google	31	39	15	37	122
				answered question	122
				skipped question	0

Question 9:

Please rank the following barriers in terms of their impact on the competitiveness of wireline operators as they attempt to transform their business					
Answer Options	Highest Impact	High Impact	Low Impact	Lowest Impact	Response Count
a. Internal resistance in the organization	30	49	21	22	122
b. Out-of-date business model that didn't keep up with changes in markets and technologies	67	30	20	5	122
c. Eroded profitability, saturated markets, and many initiatives with limited liquidity	18	23	52	29	122
d. Too much regulations that are diminishing the attractiveness of the industry	7	20	29	66	122
				answered question	122
				skipped question	0

Question 10:

Please rank the following Key Success Factors in terms of their significance to evaluate the effectiveness of any new business model for wireline operators					
Answer Options	Most Significant	Very Significant	Less Significant	Least Significant	Response Count
a. Have a modern, scalable, and reliable network infrastructure	52	40	27	3	122
b. Become a one-stop shop for all telecom services and applications	42	33	33	14	122
c. Have a lean organization with efficient operation and low cost structure	25	38	47	12	122
d. Maximize control/monopoly over network, products, and services	3	11	15	93	122
				answered question	122
				skipped question	0

Background Question 1:

Please indicate the type of business for your company		
Answer Options	Response Percent	Response Count
Comp. vendor	12.3%	15
System vendor	45.9%	56
Operator	20.5%	25
Others	21.3%	26
	answered question	122
	skipped question	0

Background Question 2:

Please indicate your location		
Answer Options	Response Percent	Response Count
North America	41.8%	51
Europe	13.9%	17
Asia Pacific	13.9%	17
Emerg. Markets	30.3%	37
	answered question	122
	skipped question	0

Background Question 3:

Please indicate your position		
Answer Options	Response Percent	Response Count
Executive	38.5%	47
Manager	27.9%	34
Engineer	24.6%	30
Others	9.0%	11
	answered question	122
	skipped question	0

Appendix II

Survey Statistical Analysis:

Correlation Matrix

```
                                  The SAS System          09:17 Friday, March 18, 2011  20

                                 The CORR Procedure

  40  Variables:    a_Existing_rel       b_Own_phys_net       c_Fin_str            d_Reput_exp
                    a_Outdated_net       b_Low_serv_qual      c_Expen_telec        d_Limit_rigid
                    a_Oth_telcos_attack  b_Cable_Sat_Wire     c_Equip_vend_sys     d_Co_understa
                    a_Bus_serv_cloud     b_Ultra_speed_Inter  c_New_revenues       d_Smart_home_sol
                    a_Invest_net         b_Use_billing_rel    c_Gen_rev_Wholes     d_Converge_net_serv
                    a_Access_Net         b_Core_Net           c_Service_Apps       d_QoS_monitor
                    a_Strategic_collab   b_Effective_regul    c_Cont_invest        d_Bundling_serv
                    a_Sys_vend_integ     b_Oth_oper_wholesale c_Cont_provid        d_Net_co_Skype
                    a_Int_resist         b_Out_date_bus       c_Erod_profit        d_Much_reg
                    a_Mod_scalable       b_One_stop_shop      c_Lean_org           d_Max_cont_mono


                                 Simple Statistics

Variable                    N          Mean       Std Dev           Sum       Minimum       Maximum
a_Existing_rel            116       1.95690       1.09855     227.00000             0       3.00000
b_Own_phys_net            116       1.34483       1.05586     156.00000             0       3.00000
c_Fin_str                 116       1.53448       1.01665     178.00000             0       3.00000
d_Reput_exp               116       1.16379       1.15679     135.00000             0       3.00000
a_Outdated_net            116       1.63793       1.05002     190.00000             0       3.00000
b_Low_serv_qual           116       2.14655       1.04052     249.00000             0       3.00000
c_Expen_telec             116       1.00862       0.94635     117.00000             0       3.00000
d_Limit_rigid             116       1.20690       1.09161     140.00000             0       3.00000
a_Oth_telcos_attack       116       1.70690       0.95113     198.00000             0       3.00000
b_Cable_Sat_Wire          116       2.05172       0.85307     238.00000             0       3.00000
c_Equip_vend_sys          116       0.50000       0.74015      58.00000             0       3.00000
d_Co_understa             116       1.74138       1.20232     202.00000             0       3.00000
a_Bus_serv_cloud          116       2.27586       0.89040     264.00000             0       3.00000
b_Ultra_speed_Inter       116       1.27586       1.03492     148.00000             0       3.00000
c_New_revenues            116       1.74138       0.97017     202.00000             0       3.00000
d_Smart_home_sol          116       0.70690       0.94194      82.00000             0       3.00000
a_Invest_net              116       1.88793       1.17785     219.00000             0       3.00000
b_Use_billing_rel         116       1.05172       1.07820     122.00000             0       3.00000
c_Gen_rev_Wholes          116       1.25000       0.92195     145.00000             0       3.00000
d_Converge_net_serv       116       1.81034       1.06251     210.00000             0       3.00000
a_Access_Net              116       1.99138       1.09937     231.00000             0       3.00000
b_Core_Net                116       1.37931       1.03550     160.00000             0       3.00000
c_Service_Apps            116       1.83621       1.01248     213.00000             0       3.00000
d_QoS_monitor             116       0.79310       0.92799      92.00000             0       3.00000
a_Strategic_collab        116       1.55172       0.99865     180.00000             0       3.00000
b_Effective_regul         116       0.80172       1.04856      93.00000             0       3.00000
c_Cont_invest             116       2.07759       0.95235     241.00000             0       3.00000
d_Bundling_serv           116       1.56897       1.09722     182.00000             0       3.00000
a_Sys_vend_integ          116       1.43966       1.12898     167.00000             0       3.00000
b_Oth_oper_wholesale      116       1.06897       1.01916     124.00000             0       3.00000
c_Cont_provid             116       2.00000       0.96007     232.00000             0       3.00000
d_Net_co_Skype            116       1.49138       1.16839     173.00000             0       3.00000
```

a_Int_resist	116	1.68966	1.04185	196.00000	0	3.00000
b_Out_date_bus	116	2.31034	0.88871	268.00000	0	3.00000
c_Erod_profit	116	1.24138	0.98352	144.00000	0	3.00000
d_Much_reg	116	0.75862	0.93827	88.00000	0	3.00000
a_Mod_scalable	116	2.18103	0.85057	253.00000	0	3.00000
b_One_stop_shop	116	1.82759	1.03231	212.00000	0	3.00000
c_Lean_org	116	1.59483	0.92293	185.00000	0	3.00000
d_Max_cont_mono	116	0.39655	0.76760	46.00000	0	3.00000

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The CORR Procedure

Pearson Correlation Coefficients, N = 116
Prob > |r| under H0: Rho=0

	a_Existing_rel	b_Own_phys_net	c_Fin_str	d_Reput_exp	a_Outdated_net	b_Low_serv_qual	c_Expen_telec
a_Existing_rel	1.00000	-0.30194	-0.37627	-0.34337	0.12958	0.08165	-0.12510
		0.0010	<.0001	0.0002	0.1656	0.3836	0.1809
b_Own_phys_net	-0.30194	1.00000	-0.22179	-0.43109	0.09791	-0.21261	0.14494
	0.0010		0.0167	<.0001	0.2958	0.0219	0.1206
c_Fin_str	-0.37627	-0.22179	1.00000	-0.31909	-0.29774	-0.04181	0.13978
	<.0001	0.0167		0.0005	0.0012	0.6559	0.1345
d_Reput_exp	-0.34337	-0.43109	-0.31909	1.00000	0.04925	0.15327	-0.13634
	0.0002	<.0001	0.0005		0.5996	0.1005	0.1445
a_Outdated_net	0.12958	0.09791	-0.29774	0.04925	1.00000	-0.26141	-0.32937
	0.1656	0.2958	0.0012	0.5996		0.0046	0.0003
b_Low_serv_qual	0.08165	-0.21261	-0.04181	0.15327	-0.26141	1.00000	-0.33686
	0.3836	0.0219	0.6559	0.1005	0.0046		0.0002
c_Expen_telec	-0.12510	0.14494	0.13978	-0.13634	-0.32937	-0.33686	1.00000
	0.1809	0.1206	0.1345	0.1445	0.0003	0.0002	
d_Limit_rigid	-0.09402	-0.01717	0.20507	-0.07527	-0.42719	-0.40971	-0.22901
	0.3155	0.8548	0.0272	0.4219	<.0001	<.0001	0.0134
a_Oth_telcos_attack	-0.00387	-0.12361	-0.03442	0.14676	-0.00270	0.22830	0.06080
	0.9671	0.1862	0.7138	0.1159	0.9770	0.0137	0.5168
b_Cable_Sat_Wire	0.00240	0.01864	0.03803	-0.05272	0.10846	-0.26332	-0.04364
	0.9796	0.8426	0.6852	0.5741	0.2465	0.0043	0.6418
c_Equip_vend_sys	-0.05882	0.08902	-0.01156	-0.01523	0.20140	-0.16372	0.16760
	0.5305	0.3420	0.9020	0.8711	0.0302	0.0791	0.0721
d_Co_understa	0.03757	0.02976	0.00736	-0.06931	-0.19880	0.10702	-0.12030
	0.6888	0.7511	0.9375	0.4597	0.0324	0.2529	0.1983
a_Bus_serv_cloud	-0.11220	-0.00032	0.04704	0.06550	0.06126	0.16247	-0.24020
	0.2305	0.9973	0.6161	0.4848	0.5136	0.0814	0.0094
b_Ultra_speed_Inter	-0.10418	0.09522	-0.05871	0.06362	0.23675	-0.15899	0.08634
	0.2658	0.3093	0.5313	0.4975	0.0105	0.0882	0.3568
c_New_revenues	0.21790	-0.08196	-0.04378	-0.09365	-0.09272	0.08956	-0.03544
	0.0188	0.3818	0.6408	0.3174	0.3222	0.3391	0.7057

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The CORR Procedure

Pearson Correlation Coefficients, N = 116
Prob > |r| under H0: Rho=0

	d_Limit_rigid	a_Oth_telcos_attack	b_Cable_Sat_Wire	c_Equip_vend_sys	d_Co_understa	a_Bus_serv_cloud	b_Ultra_speed_Inter	c_New_revenues
a_Existing_rel	-0.09402	-0.00387	0.00240	-0.05882	0.03757	-0.11220	-0.10418	0.21790
	0.3155	0.9671	0.9796	0.5305	0.6888	0.2305	0.2658	0.0188
b_Own_phys_net	-0.01717	-0.12361	0.01864	0.08902	0.02976	-0.00032	0.09522	-0.08196
	0.8548	0.1862	0.8426	0.3420	0.7511	0.9973	0.3093	0.3818
c_Fin_str	0.20507	-0.03442	0.03803	-0.01156	0.00736	0.04704	-0.05871	-0.04378
	0.0272	0.7138	0.6852	0.9020	0.9375	0.6161	0.5313	0.6408

d_Reput_exp	-0.07527	0.14676	-0.05272	-0.01523	-0.06931	0.06550	0.06362	-0.09365
	0.4219	0.1159	0.5741	0.8711	0.4597	0.4848	0.4975	0.3174
a_Outdated_net	-0.42719	-0.00270	0.10846	0.20140	-0.19880	0.06126	0.23675	-0.09272
	<.0001	0.9770	0.2465	0.0302	0.0324	0.5136	0.0105	0.3222
b_Low_serv_qual	-0.40971	0.22830	-0.26332	-0.16372	0.10702	0.16247	-0.15899	0.08956
	<.0001	0.0137	0.0043	0.0791	0.2529	0.0814	0.0882	0.3391
c_Expen_telec	-0.22901	0.06080	-0.04364	0.16760	-0.12030	-0.24020	0.08634	-0.03544
	0.0134	0.5168	0.6418	0.0721	0.1983	0.0094	0.3568	0.7057
d_Limit_rigid	1.00000	-0.26772	0.18450	-0.18296	0.19351	-0.00555	-0.15102	0.03454
		0.0037	0.0474	0.0493	0.0374	0.9528	0.1056	0.7128
a_Oth_telcos_attack	-0.26772	1.00000	-0.33482	-0.12352	-0.47748	-0.16039	-0.07615	0.14330
	0.0037		0.0002	0.1865	<.0001	0.0854	0.4165	0.1249
b_Cable_Sat_Wire	0.18450	-0.33482	1.00000	-0.01377	-0.43618	-0.00750	0.19053	-0.19383
	0.0474	0.0002		0.8833	<.0001	0.9363	0.0405	0.0371
c_Equip_vend_sys	-0.18296	-0.12352	-0.01377	1.00000	-0.50812	-0.03958	0.28380	-0.20586
	0.0493	0.1865	0.8833		<.0001	0.6731	0.0020	0.0266
d_Co_understa	0.19351	-0.47748	-0.43618	-0.50812	1.00000	0.15657	-0.24965	0.15089
	0.0374	<.0001	<.0001	<.0001		0.0933	0.0069	0.1059
a_Bus_serv_cloud	-0.00555	-0.16039	-0.00750	-0.03958	0.15657	1.00000	-0.19654	-0.32941
	0.9528	0.0854	0.9363	0.6731	0.0933		0.0345	0.0003
b_Ultra_speed_Inter	-0.15102	-0.07615	0.19053	0.28380	-0.24965	-0.19654	1.00000	-0.49126
	0.1056	0.4165	0.0405	0.0020	0.0069	0.0345		<.0001
c_New_revenues	0.03454	0.14330	-0.19383	-0.20586	0.15089	-0.32941	-0.49126	1.00000
	0.7128	0.1249	0.0371	0.0266	0.1059	0.0003	<.0001	

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The CORR Procedure

Pearson Correlation Coefficients, N = 116
Prob > |r| under H0: Rho=0

	d_Smart_ home_sol	a_Invest_ net	b_Use_ billing_ rel	c_Gen_rev_ Wholes	d_Converge_ net_serv	a_Access_ Net	b_Core_ Net
a_Existing_rel	-0.00391	0.03656	-0.01278	0.12234	-0.13371	-0.00751	-0.04666
	0.9668	0.6968	0.8917	0.1908	0.1524	0.9362	0.6190
b_Own_phys_net	-0.01990	-0.03158	0.03766	0.06253	-0.05746	0.04753	0.02249
	0.8321	0.7364	0.6881	0.5049	0.5401	0.6124	0.8106
c_Fin_str	0.06513	-0.10204	0.14908	-0.14380	0.08661	-0.13588	-0.07035
	0.4873	0.2757	0.1102	0.1236	0.3553	0.1458	0.4530
d_Reput_exp	-0.03536	0.08379	-0.15326	-0.04688	0.10332	0.08317	0.08561
	0.7063	0.3712	0.1005	0.6173	0.2697	0.3747	0.3609
a_Outdated_net	-0.22252	0.09346	-0.18301	0.05839	0.03145	0.10273	-0.00855
	0.0164	0.3183	0.0493	0.5336	0.7376	0.2725	0.9274
b_Low_serv_qual	-0.07113	0.10575	-0.06882	-0.14730	0.08042	0.09994	-0.16503
	0.4480	0.2585	0.4629	0.1146	0.3908	0.2858	0.0767
c_Expen_telec	0.16869	0.03208	0.03365	0.07724	-0.13673	-0.01664	0.07650
	0.0703	0.7325	0.7199	0.4099	0.1433	0.8592	0.4144
d_Limit_rigid	0.13560	-0.21852	0.21247	0.01728	0.01163	-0.17965	0.09921
	0.1467	0.0184	0.0220	0.8539	0.9014	0.0537	0.2893
a_Oth_telcos_attack	0.08769	0.11790	-0.06988	0.08429	-0.13293	-0.11886	0.02557
	0.3493	0.2075	0.4560	0.3683	0.1549	0.2038	0.7852
b_Cable_Sat_Wire	-0.00261	0.01447	-0.02184	0.10503	-0.08502	0.16737	0.15479
	0.9778	0.8775	0.8160	0.2618	0.3642	0.0725	0.0971
c_Equip_vend_sys	-0.06236	-0.05486	0.11986	0.01911	-0.07740	0.06946	0.26095
	0.5060	0.5586	0.2000	0.8386	0.4089	0.4587	0.0047
d_Co_understa	-0.02912	-0.06977	-0.00301	-0.15297	0.21313	-0.06749	-0.29070
	0.7563	0.4568	0.9744	0.1011	0.0216	0.4716	0.0015

a_Bus_serv_cloud	-0.39005	0.00486	-0.00593	-0.06356	0.05578	0.12682	0.14017
	<.0001	0.9587	0.9496	0.4979	0.5520	0.1749	0.1334
b_Ultra_speed_Inter	-0.40694	0.05412	-0.04407	0.17316	-0.16552	0.18553	0.12871
	<.0001	0.5640	0.6385	0.0631	0.0758	0.0462	0.1685
c_New_revenues	-0.17883	-0.09407	0.04615	-0.14097	0.17977	-0.15701	-0.10924
	0.0548	0.3152	0.6228	0.1312	0.0535	0.0923	0.2431

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The CORR Procedure

Pearson Correlation Coefficients, N = 116
Prob > |r| under H0: Rho=0

	c_Service_ Apps	d_QoS_ monitor	a_Strategic_ collab	b_Effective_ regul	c_Cont_ invest	d_Bundling_ serv
a_Existing_rel	0.09523	-0.04294	-0.08118	-0.06033	0.07803	0.06381
	0.3092	0.6472	0.3864	0.5200	0.4051	0.4962
b_Own_phys_net	0.03702	-0.12180	0.04066	0.06229	0.07693	-0.16332
	0.6932	0.1928	0.6647	0.5065	0.4117	0.0798
c_Fin_str	0.10268	0.12745	0.18665	-0.16891	-0.09709	0.07580
	0.2727	0.1728	0.0448	0.0699	0.2998	0.4187
d_Reput_exp	-0.21448	0.03994	-0.12407	0.14888	-0.05899	0.02185
	0.0208	0.6703	0.1845	0.1107	0.5293	0.8159
a_Outdated_net	0.01735	-0.13109	0.00972	-0.07367	0.05442	0.01431
	0.8534	0.1607	0.9175	0.4319	0.5618	0.8788
b_Low_serv_qual	0.01473	0.04969	0.06377	0.01092	0.00598	-0.07367
	0.8753	0.5963	0.4964	0.9073	0.9492	0.4319
c_Expen_telec	-0.16187	0.11097	-0.03268	0.13318	0.03784	-0.13038
	0.0826	0.2357	0.7277	0.1541	0.6867	0.1630
d_Limit_rigid	0.10961	-0.01746	-0.04181	-0.05501	-0.09086	0.16949
	0.2415	0.8524	0.6559	0.5575	0.3321	0.0689
a_Oth_telcos_attack	0.04001	0.06862	0.23582	0.07201	-0.14747	-0.15544
	0.6698	0.4642	0.0108	0.4424	0.1142	0.0957
b_Cable_Sat_Wire	-0.22166	-0.12916	-0.17669	0.15738	-0.05850	0.06119
	0.0168	0.1670	0.0578	0.0916	0.5328	0.5141
c_Equip_vend_sys	-0.19146	-0.16458	0.10588	0.18487	-0.16654	-0.12849
	0.0395	0.0775	0.2580	0.0470	0.0740	0.1693
d_Co_understa	0.24349	0.13867	-0.12636	-0.28244	0.26069	0.15865
	0.0084	0.1377	0.1765	0.0021	0.0047	0.0889
a_Bus_serv_cloud	0.04091	-0.35128	-0.09442	0.06841	-0.00495	0.02486
	0.6628	0.0001	0.3134	0.4656	0.9579	0.7911
b_Ultra_speed_Inter	-0.28845	-0.04871	0.05338	0.29925	-0.23365	-0.13177
	0.0017	0.6036	0.5693	0.0011	0.0116	0.1586
c_New_revenues	0.17781	0.11390	-0.11173	-0.26454	0.15367	0.22112
	0.0562	0.2234	0.2325	0.0041	0.0996	0.0171

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The CORR Procedure

Pearson Correlation Coefficients, N = 116
Prob > |r| under H0: Rho=0

	a_Sys_ vend_ integ	b_Oth_oper_ wholesale	c_Cont_ provid	d_Net_ co_Skype	a_Int_ resist	b_Out_ date_bus	c_Erod_ profit
a_Existing_rel	-0.13883	-0.06722	0.16489	0.05729	0.07178	0.06726	0.04995
	0.1372	0.4734	0.0769	0.5413	0.4438	0.4731	0.5944
b_Own_phys_net	-0.01887	-0.01421	0.06862	-0.02576	0.09022	-0.04090	-0.09760
	0.8407	0.8797	0.4642	0.7837	0.3355	0.6629	0.2973
c_Fin_str	-0.00196	-0.10302	0.02673	0.06980	-0.03907	0.01693	-0.05188
	0.9833	0.2711	0.7758	0.4566	0.6771	0.8569	0.5802

d_Reput_exp	0.15079	0.16735	-0.24272	-0.09223	-0.11619	-0.04142	0.08724
	0.1062	0.0726	0.0087	0.3248	0.2142	0.6589	0.3518
a_Outdated_net	-0.00392	-0.11460	-0.12076	0.20298	-0.19899	0.16805	0.08536
	0.9667	0.2206	0.1966	0.0289	0.0322	0.0714	0.3622
b_Low_serv_qual	0.01129	-0.07521	0.19150	-0.10266	0.13055	0.12906	-0.18781
	0.9042	0.4223	0.0395	0.2728	0.1625	0.1674	0.0435
c_Expen_telec	0.13478	0.27887	-0.20099	-0.20834	0.04683	-0.38576	0.17525
	0.1492	0.0024	0.0305	0.0248	0.6176	<.0001	0.0599
d_Limit_rigid	-0.12384	-0.05983	0.10786	0.08322	0.02637	0.04976	-0.05502
	0.1853	0.5235	0.2491	0.3744	0.7788	0.5958	0.5575
a_Oth_telcos_attack	0.16964	0.11074	-0.06666	-0.20574	0.16189	0.00568	-0.19328
	0.0687	0.2366	0.4771	0.0267	0.0825	0.9518	0.0376
b_Cable_Sat_Wire	0.02133	0.09588	-0.09556	-0.02572	0.00843	-0.04430	0.13009
	0.8202	0.3059	0.3076	0.7840	0.9284	0.6368	0.1640
c_Equip_vend_sys	0.30699	0.16139	-0.25698	-0.22624	-0.12404	-0.22473	0.21502
	0.0008	0.0835	0.0054	0.0146	0.1846	0.0153	0.0205
d_Co_understa	-0.33831	-0.25498	0.27873	0.32028	-0.05769	0.16529	-0.07176
	0.0002	0.0057	0.0024	0.0005	0.5385	0.0762	0.4440
a_Bus_serv_cloud	-0.06980	-0.05948	-0.01017	0.12768	0.03685	-0.08715	0.00274
	0.4566	0.5259	0.9137	0.1720	0.6945	0.3522	0.9767
b_Ultra_speed_Inter	0.16322	0.26211	-0.22754	-0.19937	-0.04088	-0.12226	0.07924
	0.0800	0.0045	0.0140	0.0319	0.6631	0.1911	0.3978
c_New_revenues	-0.20491	-0.14890	0.26140	0.11308	0.03174	0.00313	-0.05248
	0.0273	0.1107	0.0046	0.2268	0.7352	0.9734	0.5758

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The CORR Procedure

Pearson Correlation Coefficients, N = 116
Prob > |r| under H0: Rho=0

	d_Much_ reg	a_Mod_ scalable	b_One_ stop_ shop	c_Lean_ org	d_Max_ cont_ mono
a_Existing_rel	-0.19578	0.04565	0.01639	0.05981	-0.14455
	0.0352	0.6266	0.8613	0.5236	0.1216
b_Own_phys_net	0.04086	-0.01202	0.00715	-0.03385	0.04440
	0.6632	0.8981	0.9393	0.7183	0.6361
c_Fin_str	0.08173	-0.12292	0.08857	0.03819	-0.02882
	0.3831	0.1886	0.3444	0.6840	0.7588
d_Reput_exp	0.07680	0.07565	-0.09994	-0.05947	0.12207
	0.4125	0.4196	0.2858	0.5260	0.1917
a_Outdated_net	-0.02770	0.19087	-0.00996	-0.12578	-0.04688
	0.7679	0.0401	0.9155	0.1785	0.6173
b_Low_serv_qual	-0.07033	0.05819	-0.13818	0.12575	-0.02985
	0.4531	0.5350	0.1391	0.1786	0.7505
c_Expen_telec	0.12967	-0.15320	0.17956	-0.04575	-0.01672
	0.1653	0.1006	0.0538	0.6258	0.8586
d_Limit_rigid	-0.01874	-0.10625	-0.01437	0.04077	0.08803
	0.8418	0.2563	0.8783	0.6639	0.3474
a_Oth_telcos_attack	0.01747	0.11990	-0.01649	-0.01759	-0.08953
	0.8523	0.1998	0.8605	0.8513	0.3392
b_Cable_Sat_Wire	-0.10377	-0.14484	0.03984	-0.01733	0.12776
	0.2676	0.1208	0.6711	0.8535	0.1717
c_Equip_vend_sys	0.12521	0.14503	-0.03414	-0.27368	0.21428
	0.1805	0.1203	0.7160	0.0030	0.0209
d_Co_understa	-0.01728	-0.08137	0.00580	0.19469	-0.15173
	0.8540	0.3852	0.9507	0.0362	0.1040

a_Bus_serv_cloud	0.03876	0.03682	-0.10863	0.08429	0.00395
	0.6795	0.6948	0.2457	0.3683	0.9664
b_Ultra_speed_Inter	0.07812	0.01192	0.10188	-0.18239	0.06907
	0.4045	0.8989	0.2765	0.0500	0.4613
c_New_revenues	0.01680	0.03616	0.05928	0.08590	-0.22307
	0.8579	0.7000	0.5273	0.3592	0.0161

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The CORR Procedure

Pearson Correlation Coefficients, N = 116
Prob > |r| under H0: Rho=0

	a_Existing_ rel	b_Own_ phys_net	c_Fin_str	d_Reput_ exp	a_Outdated_ net	b_Low_ serv_ qual	c_Expen_ telec
d_Smart_home_sol	-0.00391	-0.01990	0.06513	-0.03536	-0.22252	-0.07113	0.16869
	0.9668	0.8321	0.4873	0.7063	0.0164	0.4480	0.0703
a_Invest_net	0.03656	-0.03158	-0.10204	0.08379	0.09346	0.10575	0.03208
	0.6968	0.7364	0.2757	0.3712	0.3183	0.2585	0.7325
b_Use_billing_rel	-0.01278	0.03766	0.14908	-0.15326	-0.18301	-0.06882	0.03365
	0.8917	0.6881	0.1102	0.1005	0.0493	0.4629	0.7199
c_Gen_rev_Wholes	0.12234	0.06253	-0.14380	-0.04688	0.05839	-0.14730	0.07724
	0.1908	0.5049	0.1236	0.6173	0.5336	0.1146	0.4099
d_Converge_net_serv	-0.13371	-0.05746	0.08661	0.10332	0.03145	0.08042	-0.13673
	0.1524	0.5401	0.3553	0.2697	0.7376	0.3908	0.1433
a_Access_Net	-0.00751	0.04753	-0.13588	0.08317	0.10273	0.09994	-0.01664
	0.9362	0.6124	0.1458	0.3747	0.2725	0.2858	0.8592
b_Core_Net	-0.04666	0.02249	-0.07035	0.08561	-0.00855	-0.16503	0.07650
	0.6190	0.8106	0.4530	0.3609	0.9274	0.0767	0.4144
c_Service_Apps	0.09523	0.03702	0.10268	-0.21448	0.01735	0.01473	-0.16187
	0.3092	0.6932	0.2727	0.0208	0.8534	0.8753	0.0826
d_QoS_monitor	-0.04294	-0.12180	0.12745	0.03994	-0.13109	0.04969	0.11097
	0.6472	0.1928	0.1728	0.6703	0.1607	0.5963	0.2357
a_Strategic_collab	-0.08118	0.04066	0.18665	-0.12407	0.00972	0.06377	-0.03268
	0.3864	0.6647	0.0448	0.1845	0.9175	0.4964	0.7277
b_Effective_regul	-0.06033	0.06229	-0.16891	0.14888	-0.07367	0.01092	0.13318
	0.5200	0.5065	0.0699	0.1107	0.4319	0.9073	0.1541
c_Cont_invest	0.07803	0.07693	-0.09709	-0.05899	0.05442	0.00598	0.03784
	0.4051	0.4117	0.2998	0.5293	0.5618	0.9492	0.6867
d_Bundling_serv	0.06381	-0.16332	0.07580	0.02185	0.01431	-0.07367	-0.13038
	0.4962	0.0798	0.4187	0.8159	0.8788	0.4319	0.1630
a_Sys_vend_integ	-0.13883	-0.01887	-0.00196	0.15079	-0.00392	0.01129	0.13478
	0.1372	0.8407	0.9833	0.1062	0.9667	0.9042	0.1492
b_Oth_oper_wholesale	-0.06722	-0.01421	-0.10302	0.16735	-0.11460	-0.07521	0.27887
	0.4734	0.8797	0.2711	0.0726	0.2206	0.4223	0.0024

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The CORR Procedure

Pearson Correlation Coefficients, N = 116
Prob > |r| under H0: Rho=0

	d_Limit_ rigid	a_Oth_ telcos_ attack	b_Cable_ Sat_Wire	c_Equip_ vend_sys	d_Co_ understa	a_Bus_ serv_ cloud	b_Ultra_ speed_ Inter	c_New_ revenues
d_Smart_home_sol	0.13560	0.08769	-0.00261	-0.06236	-0.02912	-0.39005	-0.40694	-0.17883
	0.1467	0.3493	0.9778	0.5060	0.7563	<.0001	<.0001	0.0548
a_Invest_net	-0.21852	0.11790	0.01447	-0.05486	-0.06977	0.00486	0.05412	-0.09407
	0.0184	0.2075	0.8775	0.5586	0.4568	0.9587	0.5640	0.3152
b_Use_billing_rel	0.21247	-0.06988	-0.02184	0.11986	-0.00301	-0.00593	-0.04407	0.04615
	0.0220	0.4560	0.8160	0.2000	0.9744	0.9496	0.6385	0.6228

c_Gen_rev_Wholes	0.01728	0.08429	0.10503	0.01911	-0.15297	-0.06356	0.17316	-0.14097
	0.8539	0.3683	0.2618	0.8386	0.1011	0.4979	0.0631	0.1312
d_Converge_net_serv	0.01163	-0.13293	-0.08502	-0.07740	0.21313	0.05578	-0.16552	0.17977
	0.9014	0.1549	0.3642	0.4089	0.0216	0.5520	0.0758	0.0535
a_Access_Net	-0.17965	-0.11886	0.16737	0.06946	-0.06749	0.12682	0.18553	-0.15701
	0.0537	0.2038	0.0725	0.4587	0.4716	0.1749	0.0462	0.0923
b_Core_Net	0.09921	0.02557	0.15479	0.26095	-0.29070	0.14017	0.12871	-0.10924
	0.2893	0.7852	0.0971	0.0047	0.0015	0.1334	0.1685	0.2431
c_Service_Apps	0.10961	0.04001	-0.22166	-0.19146	0.24349	0.04091	-0.28845	0.17781
	0.2415	0.6698	0.0168	0.0395	0.0084	0.6628	0.0017	0.0562
d_QoS_monitor	-0.01746	0.06862	-0.12916	-0.16458	0.13867	-0.35128	-0.04871	0.11390
	0.8524	0.4642	0.1670	0.0775	0.1377	0.0001	0.6036	0.2234
a_Strategic_collab	-0.04181	0.23582	-0.17669	0.10588	-0.12636	-0.09442	0.05338	-0.11173
	0.6559	0.0108	0.0578	0.2580	0.1765	0.3134	0.5693	0.2325
b_Effective_regul	-0.05501	0.07201	0.15738	0.18487	-0.28244	0.06841	0.29925	-0.26454
	0.5575	0.4424	0.0916	0.0470	0.0021	0.4656	0.0011	0.0041
c_Cont_invest	-0.09086	-0.14747	-0.05850	-0.16654	0.26069	-0.00495	-0.23365	0.15367
	0.3321	0.1142	0.5328	0.0740	0.0047	0.9579	0.0116	0.0996
d_Bundling_serv	0.16949	-0.15544	0.06119	-0.12849	0.15865	0.02486	-0.13177	0.22112
	0.0689	0.0957	0.5141	0.1693	0.0889	0.7911	0.1586	0.0171
a_Sys_vend_integ	-0.12384	0.16964	0.02133	0.30699	-0.33831	-0.06980	0.16322	-0.20491
	0.1853	0.0687	0.8202	0.0008	0.0002	0.4566	0.0800	0.0273
b_Oth_oper_wholesale	-0.05983	0.11074	0.09588	0.16139	-0.25498	-0.05948	0.26211	-0.14890
	0.5235	0.2366	0.3059	0.0835	0.0057	0.5259	0.0045	0.1107

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The CORR Procedure

Pearson Correlation Coefficients, N = 116
Prob > |r| under H0: Rho=0

	d_Smart_ home_sol	a_Invest_ net	b_Use_ billing_ rel	c_Gen_rev_ Wholes	d_Converge_ net_serv	a_Access_ Net	b_Core_ Net
d_Smart_home_sol	1.00000	0.03284	0.00650	0.01502	-0.05603	-0.16201	-0.16139
		0.7264	0.9448	0.8729	0.5503	0.0823	0.0835
a_Invest_net	0.03284	1.00000	-0.39253	-0.46244	-0.30896	0.14698	-0.10743
	0.7264		<.0001	<.0001	0.0007	0.1154	0.2510
b_Use_billing_rel	0.00650	-0.39253	1.00000	-0.13559	-0.46197	0.00038	0.09910
	0.9448	<.0001		0.1467	<.0001	0.9968	0.2899
c_Gen_rev_Wholes	0.01502	-0.46244	-0.13559	1.00000	-0.21748	0.04504	-0.04554
	0.8729	<.0001	0.1467		0.0190	0.6312	0.6274
d_Converge_net_serv	-0.05603	-0.30896	-0.46197	-0.21748	1.00000	-0.20241	0.05805
	0.5503	0.0007	<.0001	0.0190		0.0293	0.5359
a_Access_Net	-0.16201	0.14698	0.00038	0.04504	-0.20241	1.00000	-0.24917
	0.0823	0.1154	0.9968	0.6312	0.0293		0.0070
b_Core_Net	-0.16139	-0.10743	0.09910	-0.04554	0.05805	-0.24917	1.00000
	0.0835	0.2510	0.2899	0.6274	0.5359	0.0070	
c_Service_Apps	0.09511	-0.15407	-0.00014	0.09083	0.09212	-0.40751	-0.46275
	0.3098	0.0987	0.9988	0.3322	0.3254	<.0001	<.0001
d_QoS_monitor	0.26825	0.11385	-0.11088	-0.10164	0.07451	-0.46203	-0.31578
	0.0036	0.2237	0.2360	0.2776	0.4267	<.0001	0.0006
a_Strategic_collab	0.14567	-0.02090	0.19131	-0.02833	-0.14638	-0.09859	-0.00232
	0.1187	0.8238	0.0397	0.7627	0.1169	0.2924	0.9803
b_Effective_regul	-0.12098	-0.13784	0.17836	0.20464	-0.20576	0.17200	0.14195
	0.1958	0.1401	0.0554	0.0276	0.0267	0.0649	0.1285
c_Cont_invest	0.10312	0.31015	-0.21565	-0.21045	0.05764	0.05878	-0.20646
	0.2707	0.0007	0.0201	0.0234	0.5389	0.5308	0.0262

d_Bundling_serv	-0.10648	-0.11844	-0.15740	0.01289	0.27984	-0.12566	0.04566
	0.2553	0.2054	0.0915	0.8907	0.0023	0.1789	0.6265
a_Sys_vend_integ	0.09770	0.07007	0.16689	-0.09816	-0.16185	0.14320	0.22058
	0.2968	0.4548	0.0734	0.2945	0.0826	0.1251	0.0173
b_Oth_oper_wholesale	-0.07840	0.12240	-0.01910	0.09254	-0.19660	0.12471	0.21395
	0.4029	0.1906	0.8387	0.3231	0.0344	0.1823	0.0211

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The CORR Procedure

Pearson Correlation Coefficients, N = 116
Prob > |r| under H0: Rho=0

	c_Service_ Apps	d_QoS_ monitor	a_Strategic_ collab	b_Effective_ regul	c_Cont_ invest	d_Bundling_ serv
d_Smart_home_sol	0.09511	0.26825	0.14567	-0.12098	0.10312	-0.10648
	0.3098	0.0036	0.1187	0.1958	0.2707	0.2553
a_Invest_net	-0.15407	0.11385	-0.02090	-0.13784	0.31015	-0.11844
	0.0987	0.2237	0.8238	0.1401	0.0007	0.2054
b_Use_billing_rel	-0.00014	-0.11088	0.19131	0.17836	-0.21565	-0.15740
	0.9988	0.2360	0.0397	0.0554	0.0201	0.0915
c_Gen_rev_Wholes	0.09083	-0.10164	-0.02833	0.20464	-0.21045	0.01289
	0.3322	0.2776	0.7627	0.0276	0.0234	0.8907
d_Converge_net_serv	0.09212	0.07451	-0.14638	-0.20576	0.05764	0.27984
	0.3254	0.4267	0.1169	0.0267	0.5389	0.0023
a_Access_Net	-0.40751	-0.46203	-0.09859	0.17200	0.05878	-0.12566
	<.0001	<.0001	0.2924	0.0649	0.5308	0.1789
b_Core_Net	-0.46275	-0.31578	-0.00232	0.14195	-0.20646	0.04566
	<.0001	0.0006	0.9803	0.1285	0.0262	0.6265
c_Service_Apps	1.00000	-0.09191	-0.05605	-0.12915	0.07642	0.10810
		0.3265	0.5501	0.1671	0.4149	0.2481
d_QoS_monitor	-0.09191	1.00000	0.18054	-0.22125	0.07736	-0.02003
	0.3265		0.0525	0.0170	0.4092	0.8310
a_Strategic_collab	-0.05605	0.18054	1.00000	-0.07731	-0.39284	-0.49531
	0.5501	0.0525		0.4094	<.0001	<.0001
b_Effective_regul	-0.12915	-0.22125	-0.07731	1.00000	-0.44598	-0.49819
	0.1671	0.0170	0.4094		<.0001	<.0001
c_Cont_invest	0.07642	0.07736	-0.39284	-0.44598	1.00000	-0.08422
	0.4149	0.4092	<.0001	<.0001		0.3687
d_Bundling_serv	0.10810	-0.02003	-0.49531	-0.49819	-0.08422	1.00000
	0.2481	0.8310	<.0001	<.0001	0.3687	
a_Sys_vend_integ	-0.33964	-0.04522	0.16090	0.21384	-0.16949	-0.20369
	0.0002	0.6298	0.0844	0.0212	0.0689	0.0283
b_Oth_oper_wholesale	-0.37660	0.02441	0.01355	0.24888	-0.22058	-0.05872
	<.0001	0.7948	0.8852	0.0071	0.0173	0.5312

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The CORR Procedure

Pearson Correlation Coefficients, N = 116
Prob > |r| under H0: Rho=0

	a_Sys_ vend_ integ	b_Oth_oper_ wholesale	c_Cont_ provid	d_Net_ co_Skype	a_Int_ resist	b_Out_ date_bus	c_Erod_ profit
d_Smart_home_sol	0.09770	-0.07840	-0.00962	-0.01812	-0.02261	0.21348	-0.03560
	0.2968	0.4029	0.9184	0.8469	0.8096	0.0214	0.7044
a_Invest_net	0.07007	0.12240	-0.13072	-0.06705	0.12730	-0.01633	-0.03650
	0.4548	0.1906	0.1619	0.4745	0.1733	0.8619	0.6973
b_Use_billing_rel	0.16689	-0.01910	-0.05880	-0.09628	0.02216	-0.12580	0.11113
	0.0734	0.8387	0.5307	0.3039	0.8134	0.1784	0.2350

c_Gen_rev_Wholes	-0.09816	0.09254	0.12771	-0.09081	0.06337	0.05306	-0.04795
	0.2945	0.3231	0.1719	0.3323	0.4992	0.5716	0.6093
d_Converge_net_serv	-0.16185	-0.19660	0.09377	0.25083	-0.21859	0.09971	-0.03070
	0.0826	0.0344	0.3167	0.0066	0.0184	0.2869	0.7435
a_Access_Net	0.14320	0.12471	-0.02472	-0.22684	0.03560	-0.02394	0.10649
	0.1251	0.1823	0.7923	0.0143	0.7044	0.7987	0.2552
b_Core_Net	0.22058	0.21395	-0.31488	-0.14102	-0.00278	-0.19517	0.13131
	0.0173	0.0211	0.0006	0.1311	0.9764	0.0358	0.1600
c_Service_Apps	-0.33964	-0.37660	0.37572	0.34795	0.05031	0.19228	-0.22192
	0.0002	<.0001	<.0001	0.0001	0.5917	0.0387	0.0167
d_QoS_monitor	-0.04522	0.02441	-0.02928	0.04646	-0.09397	0.03636	-0.03055
	0.6298	0.7948	0.7550	0.6204	0.3157	0.6984	0.7447
a_Strategic_collab	0.16090	0.01355	-0.13604	-0.05551	0.06571	0.12872	-0.12791
	0.0844	0.8852	0.1454	0.5540	0.4834	0.1685	0.1712
b_Effective_regul	0.21384	0.24888	-0.25914	-0.21079	0.11830	-0.28799	0.08054
	0.0212	0.0071	0.0050	0.0231	0.2060	0.0017	0.3901
c_Cont_invest	-0.16949	-0.22058	0.29482	0.11392	-0.08069	-0.01842	0.07267
	0.0689	0.0173	0.0013	0.2234	0.3892	0.8444	0.4382
d_Bundling_serv	-0.20369	-0.05872	0.11557	0.15308	-0.10282	0.17405	-0.02362
	0.0283	0.5312	0.2167	0.1009	0.2720	0.0617	0.8013
a_Sys_vend_integ	1.00000	0.08678	-0.52147	-0.61347	-0.01606	-0.13717	0.18552
		0.3543	<.0001	<.0001	0.8641	0.1420	0.0462
b_Oth_oper_wholesale	0.08678	1.00000	-0.47990	-0.56179	-0.08613	-0.10064	0.15675
	0.3543		<.0001	<.0001	0.3579	0.2824	0.0929

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The CORR Procedure

Pearson Correlation Coefficients, N = 116
Prob > |r| under H0: Rho=0

	d_Much_ reg	a_Mod_ scalable	b_One_ stop_ shop	c_Lean_ org	d_Max_ cont_ mono
d_Smart_home_sol	-0.13978	-0.08514	-0.07031	0.03225	0.15013
	0.1345	0.3635	0.4533	0.7311	0.1077
a_Invest_net	-0.08764	0.14194	-0.04464	-0.02614	-0.06583
	0.3496	0.1285	0.6342	0.7806	0.4826
b_Use_billing_rel	-0.02193	-0.12408	0.09402	0.03872	-0.03551
	0.8152	0.1845	0.3154	0.6798	0.7051
c_Gen_rev_Wholes	-0.07037	0.07485	0.09137	-0.21716	0.05529
	0.4529	0.4246	0.3294	0.0192	0.5555
d_Converge_net_serv	0.18046	-0.09638	-0.12521	0.17811	0.06103
	0.0526	0.3034	0.1805	0.0558	0.5152
a_Access_Net	-0.12848	0.02028	0.15192	-0.19202	0.00409
	0.1693	0.8289	0.1035	0.0389	0.9653
b_Core_Net	0.05030	0.12869	-0.19860	0.03483	0.08262
	0.5918	0.1686	0.0326	0.7105	0.3780
c_Service_Apps	-0.00537	-0.20761	0.11418	0.12378	-0.07234
	0.9544	0.0253	0.2223	0.1856	0.4403
d_QoS_monitor	0.10193	0.05888	-0.08295	0.05357	-0.01810
	0.2762	0.5301	0.3760	0.5679	0.8471
a_Strategic_collab	-0.06080	0.15779	-0.02501	-0.10443	-0.01565
	0.5168	0.0907	0.7898	0.2646	0.8676
b_Effective_regul	0.05699	-0.13490	-0.07202	-0.02084	0.27140
	0.5434	0.1488	0.4423	0.8243	0.0032
c_Cont_invest	0.03087	0.15427	-0.08357	0.15479	-0.24467
	0.7422	0.0982	0.3725	0.0971	0.0081

d_Bundling_serv	-0.02592	-0.14860	0.16413	-0.01939	-0.03275
	0.7824	0.1114	0.0783	0.8363	0.7271
a_Sys_vend_integ	-0.04671	0.07034	0.09545	-0.36166	0.22854
	0.6186	0.4531	0.3081	<.0001	0.0136
b_Oth_oper_wholesale	0.02665	0.01557	0.02793	-0.06248	0.02031
	0.7764	0.8683	0.7660	0.5052	0.8286

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The CORR Procedure

Pearson Correlation Coefficients, N = 116
Prob > \|r\| under H0: Rho=0

	a_Existing_ rel	b_Own_ phys_net	c_Fin_str	d_Reput_ exp	a_Outdated_ net	b_Low_ serv_ qual	c_Expen_ telec
c_Cont_provid	0.16489	0.06862	0.02673	-0.24272	-0.12076	0.19150	-0.20099
	0.0769	0.4642	0.7758	0.0087	0.1966	0.0395	0.0305
d_Net_co_Skype	0.05729	-0.02576	0.06980	-0.09223	0.20298	-0.10266	-0.20834
	0.5413	0.7837	0.4566	0.3248	0.0289	0.2728	0.0248
a_Int_resist	0.07178	0.09022	-0.03907	-0.11619	-0.19899	0.13055	0.04683
	0.4438	0.3355	0.6771	0.2142	0.0322	0.1625	0.6176
b_Out_date_bus	0.06726	-0.04090	0.01693	-0.04142	0.16805	0.12906	-0.38576
	0.4731	0.6629	0.8569	0.6589	0.0714	0.1674	<.0001
c_Erod_profit	0.04995	-0.09760	-0.05188	0.08724	0.08536	-0.18781	0.17525
	0.5944	0.2973	0.5802	0.3518	0.3622	0.0435	0.0599
d_Much_reg	-0.19578	0.04086	0.08173	0.07680	-0.02770	-0.07033	0.12967
	0.0352	0.6632	0.3831	0.4125	0.7679	0.4531	0.1653
a_Mod_scalable	0.04565	-0.01202	-0.12292	0.07565	0.19087	0.05819	-0.15320
	0.6266	0.8981	0.1886	0.4196	0.0401	0.5350	0.1006
b_One_stop_shop	0.01639	0.00715	0.08857	-0.09994	-0.00996	-0.13818	0.17956
	0.8613	0.9393	0.3444	0.2858	0.9155	0.1391	0.0538
c_Lean_org	0.05981	-0.03385	0.03819	-0.05947	-0.12578	0.12575	-0.04575
	0.5236	0.7183	0.6840	0.5260	0.1785	0.1786	0.6258
d_Max_cont_mono	-0.14455	0.04440	-0.02882	0.12207	-0.04688	-0.02985	-0.01672
	0.1216	0.6361	0.7588	0.1917	0.6173	0.7505	0.8586

Pearson Correlation Coefficients, N = 116
Prob > \|r\| under H0: Rho=0

	d_Limit_ rigid	a_Oth_ telcos_ attack	b_Cable_ Sat_Wire	c_Equip_ vend_sys	d_Co_ understa	a_Bus_ serv_ cloud	b_Ultra_ speed_ Inter	c_New_ revenues
c_Cont_provid	0.10786	-0.06666	-0.09556	-0.25698	0.27873	-0.01017	-0.22754	0.26140
	0.2491	0.4771	0.3076	0.0054	0.0024	0.9137	0.0140	0.0046
d_Net_co_Skype	0.08322	-0.20574	-0.02572	-0.22624	0.32028	0.12768	-0.19937	0.11308
	0.3744	0.0267	0.7840	0.0146	0.0005	0.1720	0.0319	0.2268
a_Int_resist	0.02637	0.16189	0.00843	-0.12404	-0.05769	0.03685	-0.04088	0.03174
	0.7788	0.0825	0.9284	0.1846	0.5385	0.6945	0.6631	0.7352

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The CORR Procedure

Pearson Correlation Coefficients, N = 116
Prob > \|r\| under H0: Rho=0

	d_Limit_ rigid	a_Oth_ telcos_ attack	b_Cable_ Sat_Wire	c_Equip_ vend_sys	d_Co_ understa	a_Bus_ serv_ cloud	b_Ultra_ speed_ Inter	c_New_ revenues
b_Out_date_bus	0.04976	0.00568	-0.04430	-0.22473	0.16529	-0.08715	-0.12226	0.00313
	0.5958	0.9518	0.6368	0.0153	0.0762	0.3522	0.1911	0.9734
c_Erod_profit	-0.05502	-0.19328	0.13009	0.21502	-0.07176	0.00274	0.07924	-0.05248
	0.5575	0.0376	0.1640	0.0205	0.4440	0.9767	0.3978	0.5758
d_Much_reg	-0.01874	0.01747	-0.10377	0.12521	-0.01728	0.03876	0.07812	0.01680

	0.8418	0.8523	0.2676	0.1805	0.8540	0.6795	0.4045	0.8579
a_Mod_scalable	-0.10625	0.11990	-0.14484	0.14503	-0.08137	0.03682	0.01192	0.03616
	0.2563	0.1998	0.1208	0.1203	0.3852	0.6948	0.8989	0.7000
b_One_stop_shop	-0.01437	-0.01649	0.03984	-0.03414	0.00580	-0.10863	0.10188	0.05928
	0.8783	0.8605	0.6711	0.7160	0.9507	0.2457	0.2765	0.5273
c_Lean_org	0.04077	-0.01759	-0.01733	-0.27368	0.19469	0.08429	-0.18239	0.08590
	0.6639	0.8513	0.8535	0.0030	0.0362	0.3683	0.0500	0.3592
d_Max_cont_mono	0.08803	-0.08953	0.12776	0.21428	-0.15173	0.00395	0.06907	-0.22307
	0.3474	0.3392	0.1717	0.0209	0.1040	0.9664	0.4613	0.0161

Pearson Correlation Coefficients, N = 116
Prob > |r| under H0: Rho=0

	d_Smart_ home_sol	a_Invest_ net	b_Use_ billing_ rel	c_Gen_rev_ Wholes	d_Converge_ net_serv	a_Access_ Net	b_Core_ Net
c_Cont_provid	-0.00962	-0.13072	-0.05880	0.12771	0.09377	-0.02472	-0.31488
	0.9184	0.1619	0.5307	0.1719	0.3167	0.7923	0.0006
d_Net_co_Skype	-0.01812	-0.06705	-0.09628	-0.09081	0.25083	-0.22684	-0.14102
	0.8469	0.4745	0.3039	0.3323	0.0066	0.0143	0.1311
a_Int_resist	-0.02261	0.12730	0.02216	0.06337	-0.21859	0.03560	-0.00278
	0.8096	0.1733	0.8134	0.4992	0.0184	0.7044	0.9764
b_Out_date_bus	0.21348	-0.01633	-0.12580	0.05306	0.09971	-0.02394	-0.19517
	0.0214	0.8619	0.1784	0.5716	0.2869	0.7987	0.0358
c_Erod_profit	-0.03560	-0.03650	0.11113	-0.04795	-0.03070	0.10649	0.13131
	0.7044	0.6973	0.2350	0.6093	0.7435	0.2552	0.1600
d_Much_reg	-0.13978	-0.08764	-0.02193	-0.07037	0.18046	-0.12848	0.05030
	0.1345	0.3496	0.8152	0.4529	0.0526	0.1693	0.5918

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The CORR Procedure

Pearson Correlation Coefficients, N = 116
Prob > |r| under H0: Rho=0

	d_Smart_ home_sol	a_Invest_ net	b_Use_ billing_ rel	c_Gen_rev_ Wholes	d_Converge_ net_serv	a_Access_ Net	b_Core_ Net
a_Mod_scalable	-0.08514	0.14194	-0.12408	0.07485	-0.09638	0.02028	0.12869
	0.3635	0.1285	0.1845	0.4246	0.3034	0.8289	0.1686
b_One_stop_shop	-0.07031	-0.04464	0.09402	0.09137	-0.12521	0.15192	-0.19860
	0.4533	0.6342	0.3154	0.3294	0.1805	0.1035	0.0326
c_Lean_org	0.03225	-0.02614	0.03872	-0.21716	0.17811	-0.19202	0.03483
	0.7311	0.7806	0.6798	0.0192	0.0558	0.0389	0.7105
d_Max_cont_mono	0.15013	-0.06583	-0.03551	0.05529	0.06103	0.00409	0.08262
	0.1077	0.4826	0.7051	0.5555	0.5152	0.9653	0.3780

Pearson Correlation Coefficients, N = 116
Prob > |r| under H0: Rho=0

	c_Service_ Apps	d_QoS_ monitor	a_Strategic_ collab	b_Effective_ regul	c_Cont_ invest	d_Bundling_ serv
c_Cont_provid	0.37572	-0.02928	-0.13604	-0.25914	0.29482	0.11557
	<.0001	0.7550	0.1454	0.0050	0.0013	0.2167
d_Net_co_Skype	0.34795	0.04646	-0.05551	-0.21079	0.11392	0.15308
	0.0001	0.6204	0.5540	0.0231	0.2234	0.1009
a_Int_resist	0.05031	-0.09397	0.06571	0.11830	-0.08069	-0.10282
	0.5917	0.3157	0.4834	0.2060	0.3892	0.2720
b_Out_date_bus	0.19228	0.03636	0.12872	-0.28799	-0.01842	0.17405
	0.0387	0.6984	0.1685	0.0017	0.8444	0.0617
c_Erod_profit	-0.22192	-0.03055	-0.12791	0.08054	0.07267	-0.02362
	0.0167	0.7447	0.1712	0.3901	0.4382	0.8013

d_Much_reg	-0.00537	0.10193	-0.06080	0.05699	0.03087	-0.02592
	0.9544	0.2762	0.5168	0.5434	0.7422	0.7824
a_Mod_scalable	-0.20761	0.05888	0.15779	-0.13490	0.15427	-0.14860
	0.0253	0.5301	0.0907	0.1488	0.0982	0.1114
b_One_stop_shop	0.11418	-0.08295	-0.02501	-0.07202	-0.08357	0.16413
	0.2223	0.3760	0.7898	0.4423	0.3725	0.0783
c_Lean_org	0.12378	0.05357	-0.10443	-0.02084	0.15479	-0.01939
	0.1856	0.5679	0.2646	0.8243	0.0971	0.8363

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The CORR Procedure

Pearson Correlation Coefficients, N = 116
Prob > |r| under H0: Rho=0

	c_Service_ Apps	d_QoS_ monitor	a_Strategic_ collab	b_Effective_ regul	c_Cont_ invest	d_Bundling_ serv
d_Max_cont_mono	-0.07234	-0.01810	-0.01565	0.27140	-0.24467	-0.03275
	0.4403	0.8471	0.8676	0.0032	0.0081	0.7271

Pearson Correlation Coefficients, N = 116
Prob > |r| under H0: Rho=0

	a_Sys_ vend_ integ	b_Oth_oper_ wholesale	c_Cont_ provid	d_Net_ co_Skype	a_Int_ resist	b_Out_ date_bus	c_Erod_ profit
c_Cont_provid	-0.52147	-0.47990	1.00000	0.10077	0.18256	0.08153	-0.24864
	<.0001	<.0001		0.2818	0.0498	0.3843	0.0071
d_Net_co_Skype	-0.61347	-0.56179	0.10077	1.00000	-0.05936	0.15334	-0.11168
	<.0001	<.0001	0.2818		0.5267	0.1003	0.2327
a_Int_resist	-0.01606	-0.08613	0.18256	-0.05936	1.00000	-0.27073	-0.46937
	0.8641	0.3579	0.0498	0.5267		0.0033	<.0001
b_Out_date_bus	-0.13717	-0.10064	0.08153	0.15334	-0.27073	1.00000	-0.28542
	0.1420	0.2824	0.3843	0.1003	0.0033		0.0019
c_Erod_profit	0.18552	0.15675	-0.24864	-0.11168	-0.46937	-0.28542	1.00000
	0.0462	0.0929	0.0071	0.2327	<.0001	0.0019	
d_Much_reg	-0.04671	0.02665	-0.01931	0.03775	-0.36195	-0.34737	-0.25669
	0.6186	0.7764	0.8370	0.6875	<.0001	0.0001	0.0054
a_Mod_scalable	0.07034	0.01557	-0.09584	-0.00279	0.08358	0.01706	0.02007
	0.4531	0.8683	0.3061	0.9763	0.3724	0.8558	0.8307
b_One_stop_shop	0.09545	0.02793	-0.10529	-0.03008	-0.12295	0.07779	0.09273
	0.3081	0.7660	0.2607	0.7486	0.1886	0.4065	0.3221
c_Lean_org	-0.36166	-0.06248	0.28460	0.17011	0.13035	-0.00439	-0.15955
	<.0001	0.5052	0.0020	0.0679	0.1631	0.9627	0.0871
d_Max_cont_mono	0.22854	0.02031	-0.09440	-0.16098	-0.08399	-0.11824	0.04488
	0.0136	0.8286	0.3135	0.0843	0.3701	0.2062	0.6324

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The CORR Procedure

Pearson Correlation Coefficients, N = 116
Prob > |r| under H0: Rho=0

	d_Much_ reg	a_Mod_ scalable	b_One_ stop_ shop	c_Lean_ org	d_Max_ cont_ mono
c_Cont_provid	-0.01931	-0.09584	-0.10529	0.28460	-0.09440
	0.8370	0.3061	0.2607	0.0020	0.3135
d_Net_co_Skype	0.03775	-0.00279	-0.03008	0.17011	-0.16098
	0.6875	0.9763	0.7486	0.0679	0.0843
a_Int_resist	-0.36195	0.08358	-0.12295	0.13035	-0.08399
	<.0001	0.3724	0.1886	0.1631	0.3701
b_Out_date_bus	-0.34737	0.01706	0.07779	-0.00439	-0.11824

	0.0001	0.8558	0.4065	0.9627	0.2062
c_Erod_profit	-0.25669	0.02007	0.09273	-0.15955	0.04488
	0.0054	0.8307	0.3221	0.0871	0.6324
d_Much_reg	1.00000	-0.13000	-0.03436	0.02666	0.15821
		0.1643	0.7142	0.7763	0.0899
a_Mod_scalable	-0.13000	1.00000	-0.39989	-0.35991	-0.13755
	0.1643		<.0001	<.0001	0.1409
b_One_stop_shop	-0.03436	-0.39989	1.00000	-0.41165	-0.40679
	0.7142	<.0001		<.0001	<.0001
c_Lean_org	0.02666	-0.35991	-0.41165	1.00000	-0.24993
	0.7763	<.0001	<.0001		0.0068
d_Max_cont_mono	0.15821	-0.13755	-0.40679	-0.24993	1.00000
	0.0899	0.1409	<.0001	0.0068	

Apppendix III

Survey Statistical Analysis:

T-Tests

<u>Background Bias: Asia t-test</u>

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                                     The TTEST Procedure

                                  Variable:  a_Existing_rel

        Asia            N        Mean     Std Dev     Std Err     Minimum     Maximum

        0             102      1.9510      1.0843      0.1074           0      3.0000
        1              14      2.0000      1.2403      0.3315           0      3.0000
        Diff (1-2)            -0.0490      1.1032      0.3144

Asia          Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.9510      1.7380   2.1640      1.0843      0.9532   1.2576
1                                2.0000      1.2838   2.7162      1.2403      0.8992   1.9983
Diff (1-2)    Pooled            -0.0490     -0.6719   0.5739      1.1032      0.9767   1.2677
Diff (1-2)    Satterthwaite     -0.0490     -0.7883   0.6902

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.16      0.8764
                 Satterthwaite    Unequal      15.848      -0.14      0.8899

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        13       101       1.31    0.4409


                                  Variable:  b_Own_phys_net

        Asia            N        Mean     Std Dev     Std Err     Minimum     Maximum

        0             102      1.2843      1.0843      0.1074           0      3.0000
        1              14      1.7857      0.6993      0.1869      1.0000      3.0000
        Diff (1-2)            -0.5014      1.0476      0.2986

Asia          Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.2843      1.0713   1.4973      1.0843      0.9532   1.2576
1                                1.7857      1.3820   2.1895      0.6993      0.5070   1.1266
Diff (1-2)    Pooled            -0.5014     -1.0929   0.0901      1.0476      0.9275   1.2038
Diff (1-2)    Satterthwaite     -0.5014     -0.9476  -0.0552

                 Method           Variances        DF    t Value    Pr > |t|
```

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                    Pooled           Equal           114      -1.68      0.0958
                    Satterthwaite    Unequal      22.678      -2.33      0.0293
```

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                                The TTEST Procedure

                             Variable:  b_Own_phys_net

                               Equality of Variances

                         Method      Num DF    Den DF    F Value    Pr > F

                         Folded F       101        13       2.40    0.0779


                                Variable:  c_Fin_str

             Asia            N        Mean     Std Dev     Std Err     Minimum     Maximum

             0             102      1.5392      1.0309      0.1021           0      3.0000
             1              14      1.5000      0.9405      0.2514           0      3.0000
             Diff (1-2)             0.0392      1.0210      0.2910

     Asia          Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

     0                               1.5392      1.3367   1.7417      1.0309      0.9063   1.1957
     1                               1.5000      0.9569   2.0431      0.9405      0.6818   1.5152
     Diff (1-2)    Pooled            0.0392     -0.5373   0.6157      1.0210      0.9039   1.1732
     Diff (1-2)    Satterthwaite     0.0392     -0.5318   0.6102

                    Method           Variances        DF    t Value    Pr > |t|

                    Pooled           Equal           114       0.13      0.8930
                    Satterthwaite    Unequal      17.579       0.14      0.8867

                               Equality of Variances

                         Method      Num DF    Den DF    F Value    Pr > F

                         Folded F       101        13       1.20    0.7495


                               Variable:  d_Reput_exp

             Asia            N        Mean     Std Dev     Std Err     Minimum     Maximum

             0             102      1.2255      1.1424      0.1131           0      3.0000
             1              14      0.7143      1.2044      0.3219           0      3.0000
             Diff (1-2)             0.5112      1.1496      0.3277
```

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                                The TTEST Procedure

                               Variable:  d_Reput_exp

     Asia          Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

     0                               1.2255      1.0011   1.4499      1.1424      1.0043   1.3250
     1                               0.7143      0.0189   1.4097      1.2044      0.8731   1.9403
     Diff (1-2)    Pooled            0.5112     -0.1379   1.1603      1.1496      1.0178   1.3210
     Diff (1-2)    Satterthwaite     0.5112     -0.2107   1.2331

                    Method           Variances        DF    t Value    Pr > |t|

                    Pooled           Equal           114       1.56      0.1215
                    Satterthwaite    Unequal      16.377       1.50      0.1531

                               Equality of Variances

                         Method      Num DF    Den DF    F Value    Pr > F

                         Folded F        13       101       1.11    0.7166


                             Variable:  a_Outdated_net

             Asia            N        Mean     Std Dev     Std Err     Minimum     Maximum

             0             102      1.5882      1.0279      0.1018           0      3.0000
             1              14      2.0000      1.1767      0.3145           0      3.0000
             Diff (1-2)            -0.4118      1.0459      0.2981
```

Asia	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.5882	1.3863	1.7901	1.0279	0.9036	1.1921
1		2.0000	1.3206	2.6794	1.1767	0.8531	1.8957
Diff (1-2)	Pooled	-0.4118	-1.0023	0.1788	1.0459	0.9260	1.2018
Diff (1-2)	Satterthwaite	-0.4118	-1.1130	0.2895			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-1.38	0.1699
Satterthwaite	Unequal	15.843	-1.25	0.2310

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	13	101	1.31	0.4384

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The TTEST Procedure

Variable: b_Low_serv_qual

Asia	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	102	2.2255	1.0236	0.1013	0	3.0000
1	14	1.5714	1.0163	0.2716	0	3.0000
Diff (1-2)		0.6541	1.0227	0.2915		

Asia	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		2.2255	2.0244	2.4265	1.0236	0.8998	1.1871
1		1.5714	0.9846	2.1583	1.0163	0.7368	1.6374
Diff (1-2)	Pooled	0.6541	0.0766	1.2315	1.0227	0.9055	1.1752
Diff (1-2)	Satterthwaite	0.6541	0.0419	1.2662			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	2.24	0.0268
Satterthwaite	Unequal	16.829	2.26	0.0377

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	101	13	1.01	1.0000

Variable: c_Expen_telec

Asia	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	102	0.9706	0.9487	0.0939	0	3.0000
1	14	1.2857	0.9139	0.2442	0	3.0000
Diff (1-2)		-0.3151	0.9448	0.2693		

Asia	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.9706	0.7842	1.1569	0.9487	0.8340	1.1004
1		1.2857	0.7581	1.8134	0.9139	0.6625	1.4723
Diff (1-2)	Pooled	-0.3151	-0.8486	0.2183	0.9448	0.8365	1.0857
Diff (1-2)	Satterthwaite	-0.3151	-0.8670	0.2368			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-1.17	0.2444
Satterthwaite	Unequal	17.083	-1.20	0.2449

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The TTEST Procedure

Variable: c_Expen_telec

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	101	13	1.08	0.9450

Variable: d_Limit_rigid

```
         Asia            N        Mean     Std Dev     Std Err     Minimum     Maximum

         0             102      1.2157      1.0682      0.1058           0      3.0000
         1              14      1.1429      1.2924      0.3454           0      3.0000
         Diff (1-2)             0.0728      1.0961      0.3124

 Asia         Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                               1.2157      1.0059   1.4255      1.0682      0.9391   1.2390
 1                               1.1429      0.3966   1.8891      1.2924      0.9369   2.0821
 Diff (1-2)   Pooled             0.0728     -0.5461   0.6917      1.0961      0.9704   1.2595
 Diff (1-2)   Satterthwaite      0.0728     -0.6948   0.8405

                  Method           Variances        DF    t Value    Pr > |t|

                  Pooled           Equal           114       0.23      0.8161
                  Satterthwaite    Unequal      15.535       0.20      0.8428

                                   Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F        13       101       1.46    0.2888


                               Variable:  a_Oth_telcos_attack

         Asia            N        Mean     Std Dev     Std Err     Minimum     Maximum

         0             102      1.6863      0.9225      0.0913           0      3.0000
         1              14      1.8571      1.1673      0.3120           0      3.0000
         Diff (1-2)            -0.1709      0.9536      0.2718
```

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                                    The TTEST Procedure

                               Variable:  a_Oth_telcos_attack

 Asia         Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                               1.6863      1.5051   1.8675      0.9225      0.8110   1.0700
 1                               1.8571      1.1832   2.5311      1.1673      0.8463   1.8806
 Diff (1-2)   Pooled            -0.1709     -0.7093   0.3676      0.9536      0.8443   1.0958
 Diff (1-2)   Satterthwaite     -0.1709     -0.8625   0.5208

                  Method           Variances        DF    t Value    Pr > |t|

                  Pooled           Equal           114      -0.63      0.5308
                  Satterthwaite    Unequal       15.31      -0.53      0.6067

                                   Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F        13       101       1.60    0.1941


                                Variable:  b_Cable_Sat_Wire

         Asia            N        Mean     Std Dev     Std Err     Minimum     Maximum

         0             102      2.0196      0.8557      0.0847           0      3.0000
         1              14      2.2857      0.8254      0.2206           0      3.0000
         Diff (1-2)            -0.2661      0.8523      0.2429

 Asia         Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                               2.0196      1.8515   2.1877      0.8557      0.7523   0.9925
 1                               2.2857      1.8091   2.7623      0.8254      0.5984   1.3298
 Diff (1-2)   Pooled            -0.2661     -0.7473   0.2151      0.8523      0.7546   0.9794
 Diff (1-2)   Satterthwaite     -0.2661     -0.7645   0.2323

                  Method           Variances        DF    t Value    Pr > |t|

                  Pooled           Equal           114      -1.10      0.2756
                  Satterthwaite    Unequal      17.071      -1.13      0.2757

                                   Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F       101        13       1.07    0.9501
```

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The TTEST Procedure

Variable: c_Equip_vend_sys

Asia	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	102	0.4412	0.7254	0.0718	0	3.0000
1	14	0.9286	0.7300	0.1951	0	2.0000
Diff (1-2)		-0.4874	0.7259	0.2069		

Asia	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.4412	0.2987	0.5837	0.7254	0.6377	0.8413
1		0.9286	0.5071	1.3501	0.7300	0.5292	1.1761
Diff (1-2)	Pooled	-0.4874	-0.8973	-0.0775	0.7259	0.6427	0.8341
Diff (1-2)	Satterthwaite	-0.4874	-0.9266	-0.0482			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-2.36	0.0202
Satterthwaite	Unequal	16.723	-2.34	0.0317

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	13	101	1.01	0.8901

Variable: d_Co_understa

Asia	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	102	1.8529	1.1723	0.1161	0	3.0000
1	14	0.9286	1.1411	0.3050	0	3.0000
Diff (1-2)		0.9244	1.1688	0.3331		

Asia	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.8529	1.6227	2.0832	1.1723	1.0305	1.3596
1		0.9286	0.2697	1.5874	1.1411	0.8273	1.8384
Diff (1-2)	Pooled	0.9244	0.2645	1.5843	1.1688	1.0347	1.3430
Diff (1-2)	Satterthwaite	0.9244	0.2359	1.6129			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	2.77	0.0065
Satterthwaite	Unequal	16.993	2.83	0.0115

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Variable: d_Co_understa

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	101	13	1.06	0.9844

Variable: a_Bus_serv_cloud

Asia	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	102	2.2843	0.8830	0.0874	0	3.0000
1	14	2.2143	0.9750	0.2606	0	3.0000
Diff (1-2)		0.0700	0.8940	0.2548		

Asia	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		2.2843	2.1109	2.4578	0.8830	0.7762	1.0242
1		2.2143	1.6514	2.7772	0.9750	0.7068	1.5707
Diff (1-2)	Pooled	0.0700	-0.4347	0.5748	0.8940	0.7915	1.0272
Diff (1-2)	Satterthwaite	0.0700	-0.5124	0.6525			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.27	0.7839
Satterthwaite	Unequal	16.066	0.25	0.8021

```
                              Equality of Variances

                 Method      Num DF    Den DF    F Value    Pr > F

                 Folded F        13       101       1.22    0.5540


                          Variable:  b_Ultra_speed_Inter

     Asia             N        Mean     Std Dev     Std Err     Minimum     Maximum

     0              102      1.1569      1.0220      0.1012           0      3.0000
     1               14      2.1429      0.6630      0.1772      1.0000      3.0000
     Diff (1-2)             -0.9860      0.9877      0.2815
```

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                          Variable:  b_Ultra_speed_Inter

 Asia          Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                                1.1569      0.9561   1.3576      1.0220      0.8984   1.1853
 1                                2.1429      1.7601   2.5257      0.6630      0.4806   1.0681
 Diff (1-2)    Pooled            -0.9860     -1.5436  -0.4284      0.9877      0.8744   1.1349
 Diff (1-2)    Satterthwaite     -0.9860     -1.4086  -0.5634

               Method           Variances        DF    t Value    Pr > |t|

               Pooled           Equal           114      -3.50      0.0007
               Satterthwaite    Unequal      22.554      -4.83      <.0001

                              Equality of Variances

                 Method      Num DF    Den DF    F Value    Pr > F

                 Folded F       101        13       2.38    0.0818


                            Variable:  c_New_revenues

     Asia             N        Mean     Std Dev     Std Err     Minimum     Maximum

     0              102      1.8137      0.9516      0.0942           0      3.0000
     1               14      1.2143      0.9750      0.2606           0      3.0000
     Diff (1-2)              0.5994      0.9543      0.2720

 Asia          Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                                1.8137      1.6268   2.0006      0.9516      0.8365   1.1037
 1                                1.2143      0.6514   1.7772      0.9750      0.7068   1.5707
 Diff (1-2)    Pooled             0.5994      0.0606   1.1382      0.9543      0.8449   1.0965
 Diff (1-2)    Satterthwaite      0.5994      0.0137   1.1851

               Method           Variances        DF    t Value    Pr > |t|

               Pooled           Equal           114       2.20      0.0295
               Satterthwaite    Unequal      16.585       2.16      0.0454

                              Equality of Variances

                 Method      Num DF    Den DF    F Value    Pr > F

                 Folded F        13       101       1.05    0.8228
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                           Variable:  d_Smart_home_sol

     Asia             N        Mean     Std Dev     Std Err     Minimum     Maximum

     0              102      0.7451      0.9511      0.0942           0      3.0000
     1               14      0.4286      0.8516      0.2276           0      3.0000
     Diff (1-2)              0.3165      0.9403      0.2680

 Asia          Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                                0.7451      0.5583   0.9319      0.9511      0.8361   1.1032
 1                                0.4286     -0.0631   0.9203      0.8516      0.6174   1.3720
 Diff (1-2)    Pooled             0.3165     -0.2144   0.8474      0.9403      0.8325   1.0805
 Diff (1-2)    Satterthwaite      0.3165     -0.2015   0.8345
```

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                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       1.18      0.2400
                 Satterthwaite    Unequal      17.765       1.29      0.2153

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       101        13       1.25    0.6861


                                  Variable:  a_Invest_net

        Asia             N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              102      1.9412      1.1417      0.1130           0      3.0000
        1               14      1.5000      1.4005      0.3743           0      3.0000
        Diff (1-2)              0.4412      1.1741      0.3346

Asia          Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.9412      1.7169   2.1654      1.1417      1.0036   1.3241
1                                1.5000      0.6913   2.3087      1.4005      1.0153   2.2563
Diff (1-2)    Pooled             0.4412     -0.2217   1.1041      1.1741      1.0395   1.3491
Diff (1-2)    Satterthwaite      0.4412     -0.3901   1.2724
                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       1.32      0.1900
                 Satterthwaite    Unequal      15.463       1.13      0.2764
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                                   Variable:  a_Invest_net

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        13       101       1.50    0.2569


                                 Variable:  b_Use_billing_rel

        Asia             N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              102      0.9314      1.0461      0.1036           0      3.0000
        1               14      1.9286      0.9169      0.2450           0      3.0000
        Diff (1-2)             -0.9972      1.0322      0.2942

Asia          Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                0.9314      0.7259   1.1368      1.0461      0.9196   1.2132
1                                1.9286      1.3992   2.4580      0.9169      0.6647   1.4771
Diff (1-2)    Pooled            -0.9972     -1.5800  -0.4144      1.0322      0.9138   1.1860
Diff (1-2)    Satterthwaite     -0.9972     -1.5562  -0.4382
                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -3.39      0.0010
                 Satterthwaite    Unequal      17.986      -3.75      0.0015

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       101        13       1.30    0.6174


                                 Variable:  c_Gen_rev_Wholes

        Asia             N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              102      1.1667      0.8909      0.0882           0      3.0000
        1               14      1.8571      0.9493      0.2537      1.0000      3.0000
        Diff (1-2)             -0.6905      0.8978      0.2559
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                                 Variable:  c_Gen_rev_Wholes

Asia          Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.1667      0.9917   1.3417      0.8909      0.7832   1.0333
1                                1.8571      1.3091   2.4052      0.9493      0.6882   1.5293
Diff (1-2)    Pooled            -0.6905     -1.1974  -0.1836      0.8978      0.7948   1.0316
Diff (1-2)    Satterthwaite     -0.6905     -1.2590  -0.1219

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -2.70      0.0080
                 Satterthwaite    Unequal      16.303      -2.57      0.0203

                                    Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        13       101       1.14    0.6782


                                Variable:  d_Converge_net_serv

        Asia             N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              102      1.9608      1.0042      0.0994           0      3.0000
        1               14      0.7143      0.8254      0.2206           0      2.0000
        Diff (1-2)              1.2465      0.9854      0.2809

Asia          Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.9608      1.7635   2.1580      1.0042      0.8827   1.1646
1                                0.7143      0.2377   1.1909      0.8254      0.5984   1.3298
Diff (1-2)    Pooled             1.2465      0.6901   1.8029      0.9854      0.8724   1.1323
Diff (1-2)    Satterthwaite      1.2465      0.7395   1.7535

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       4.44      <.0001
                 Satterthwaite    Unequal      18.719       5.15      <.0001

                                    Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       101        13       1.48    0.4350
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                                   Variable:  a_Access_Net

        Asia             N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              102      1.9608      1.0893      0.1079           0      3.0000
        1               14      2.2143      1.1883      0.3176           0      3.0000
        Diff (1-2)             -0.2535      1.1010      0.3138

Asia          Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.9608      1.7468   2.1747      1.0893      0.9576   1.2634
1                                2.2143      1.5282   2.9004      1.1883      0.8615   1.9144
Diff (1-2)    Pooled            -0.2535     -0.8752   0.3682      1.1010      0.9748   1.2652
Diff (1-2)    Satterthwaite     -0.2535     -0.9640   0.4570

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.81      0.4209
                 Satterthwaite    Unequal      16.144      -0.76      0.4607

                                    Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        13       101       1.19    0.5950


                                    Variable:  b_Core_Net

        Asia             N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              102      1.3235      1.0546      0.1044           0      3.0000
```

Asia	N	Mean	Std Dev	Std Err	Minimum	Maximum
1	14	1.7857	0.8018	0.2143	0	3.0000
Diff (1-2)		-0.4622	1.0289	0.2932		

Asia	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.3235	1.1164	1.5307	1.0546	0.9270	1.2231
1		1.7857	1.3228	2.2487	0.8018	0.5813	1.2917
Diff (1-2)	Pooled	-0.4622	-1.0431	0.1187	1.0289	0.9109	1.1822
Diff (1-2)	Satterthwaite	-0.4622	-0.9598	0.0354			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-1.58	0.1178
Satterthwaite	Unequal	19.763	-1.94	0.0669

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Variable: b_Core_Net

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	101	13	1.73	0.2670

Variable: c_Service_Apps

Asia	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	102	1.8922	1.0236	0.1013	0	3.0000
1	14	1.4286	0.8516	0.2276	0	3.0000
Diff (1-2)		0.4636	1.0054	0.2866		

Asia	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.8922	1.6911	2.0932	1.0236	0.8998	1.1871
1		1.4286	0.9369	1.9203	0.8516	0.6174	1.3720
Diff (1-2)	Pooled	0.4636	-0.1041	1.0313	1.0054	0.8901	1.1553
Diff (1-2)	Satterthwaite	0.4636	-0.0587	0.9859			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	1.62	0.1085
Satterthwaite	Unequal	18.572	1.86	0.0787

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	101	13	1.44	0.4665

Variable: d_QoS_monitor

Asia	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	102	0.8235	0.9164	0.0907	0	3.0000
1	14	0.5714	1.0163	0.2716	0	3.0000
Diff (1-2)		0.2521	0.9284	0.2646		

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Variable: d_QoS_monitor

Asia	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.8235	0.6435	1.0035	0.9164	0.8056	1.0629
1		0.5714	-0.0154	1.1583	1.0163	0.7368	1.6374
Diff (1-2)	Pooled	0.2521	-0.2721	0.7763	0.9284	0.8219	1.0667
Diff (1-2)	Satterthwaite	0.2521	-0.3549	0.8591			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.95	0.3427
Satterthwaite	Unequal	16.038	0.88	0.3917

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F

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                    Folded F        13       101       1.23    0.5391


                              Variable:  a_Strategic_collab

        Asia            N        Mean     Std Dev     Std Err     Minimum     Maximum

        0             102      1.4902      0.9621      0.0953           0      3.0000
        1              14      2.0000      1.1767      0.3145           0      3.0000
        Diff (1-2)            -0.5098      0.9889      0.2819

Asia          Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.4902      1.3012   1.6792      0.9621      0.8458   1.1159
1                                2.0000      1.3206   2.6794      1.1767      0.8531   1.8957
Diff (1-2)    Pooled            -0.5098     -1.0682   0.0486      0.9889      0.8755   1.1363
Diff (1-2)    Satterthwaite     -0.5098     -1.2083   0.1887

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -1.81      0.0731
                 Satterthwaite    Unequal      15.478      -1.55      0.1410

                                  Equality of Variances

                    Method      Num DF    Den DF    F Value    Pr > F

                    Folded F        13       101       1.50    0.2636
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                               Variable:  b_Effective_regul

        Asia            N        Mean     Std Dev     Std Err     Minimum     Maximum

        0             102      0.6667      0.9783      0.0969           0      3.0000
        1              14      1.7857      1.0509      0.2809           0      3.0000
        Diff (1-2)            -1.1190      0.9869      0.2813

Asia          Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                0.6667      0.4745   0.8588      0.9783      0.8600   1.1347
1                                1.7857      1.1789   2.3925      1.0509      0.7619   1.6930
Diff (1-2)    Pooled            -1.1190     -1.6762  -0.5619      0.9869      0.8737   1.1340
Diff (1-2)    Satterthwaite     -1.1190     -1.7481  -0.4900

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -3.98      0.0001
                 Satterthwaite    Unequal      16.247      -3.77      0.0016

                                  Equality of Variances

                    Method      Num DF    Den DF    F Value    Pr > F

                    Folded F        13       101       1.15    0.6490


                                 Variable:  c_Cont_invest

        Asia            N        Mean     Std Dev     Std Err     Minimum     Maximum

        0             102      2.1471      0.9481      0.0939           0      3.0000
        1              14      1.5714      0.8516      0.2276           0      3.0000
        Diff (1-2)             0.5756      0.9376      0.2672

Asia          Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                2.1471      1.9608   2.3333      0.9481      0.8335   1.0997
1                                1.5714      1.0797   2.0631      0.8516      0.6174   1.3720
Diff (1-2)    Pooled             0.5756      0.0462   1.1050      0.9376      0.8301   1.0774
Diff (1-2)    Satterthwaite      0.5756      0.0578   1.0935

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       2.15      0.0333
                 Satterthwaite    Unequal      17.733       2.34      0.0313
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Variable: c_Cont_invest

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	101	13	1.24	0.6966

Variable: d_Bundling_serv

Asia	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	102	1.6961	1.0511	0.1041	0	3.0000
1	14	0.6429	1.0082	0.2695	0	3.0000
Diff (1-2)		1.0532	1.0463	0.2982		

Asia	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.6961	1.4896	1.9025	1.0511	0.9240	1.2190
1		0.6429	0.0607	1.2250	1.0082	0.7309	1.6243
Diff (1-2)	Pooled	1.0532	0.4625	1.6440	1.0463	0.9263	1.2022
Diff (1-2)	Satterthwaite	1.0532	0.4441	1.6623			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	3.53	0.0006
Satterthwaite	Unequal	17.119	3.65	0.0020

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	101	13	1.09	0.9295

Variable: a_Sys_vend_integ

Asia	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	102	1.3529	1.0959	0.1085	0	3.0000
1	14	2.0714	1.2067	0.3225	0	3.0000
Diff (1-2)		-0.7185	1.1091	0.3161		

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Variable: a_Sys_vend_integ

Asia	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.3529	1.1377	1.5682	1.0959	0.9633	1.2710
1		2.0714	1.3747	2.7681	1.2067	0.8748	1.9440
Diff (1-2)	Pooled	-0.7185	-1.3447	-0.0923	1.1091	0.9819	1.2744
Diff (1-2)	Satterthwaite	-0.7185	-1.4395	0.00253			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-2.27	0.0249
Satterthwaite	Unequal	16.083	-2.11	0.0507

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	13	101	1.21	0.5632

Variable: b_Oth_oper_wholesale

Asia	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	102	0.9804	0.9848	0.0975	0	3.0000
1	14	1.7143	1.0690	0.2857	0	3.0000
Diff (1-2)		-0.7339	0.9948	0.2835		

Asia	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.9804	0.7870	1.1738	0.9848	0.8657	1.1422
1		1.7143	1.0970	2.3315	1.0690	0.7750	1.7223
Diff (1-2)	Pooled	-0.7339	-1.2956	-0.1722	0.9948	0.8807	1.1431
Diff (1-2)	Satterthwaite	-0.7339	-1.3733	-0.0945			

Method	Variances	DF	t Value	Pr > abs(t)
Pooled	Equal	114	-2.59	0.0109
Satterthwaite	Unequal	16.177	-2.43	0.0270

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	13	101	1.18	0.6122

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The TTEST Procedure

Variable: c_Cont_provid

Asia	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	102	2.0784	0.9407	0.0931	0	3.0000
1	14	1.4286	0.9376	0.2506	0	3.0000
Diff (1-2)		0.6499	0.9403	0.2680		

Asia	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		2.0784	1.8937	2.2632	0.9407	0.8269	1.0910
1		1.4286	0.8872	1.9699	0.9376	0.6797	1.5105
Diff (1-2)	Pooled	0.6499	0.1189	1.1808	0.9403	0.8325	1.0805
Diff (1-2)	Satterthwaite	0.6499	0.0853	1.2144			

Method	Variances	DF	t Value	Pr > abs(t)
Pooled	Equal	114	2.42	0.0169
Satterthwaite	Unequal	16.799	2.43	0.0266

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	101	13	1.01	1.0000

Variable: d_Net_co_Skype

Asia	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	102	1.5882	1.1634	0.1152	0	3.0000
1	14	0.7857	0.9750	0.2606	0	2.0000
Diff (1-2)		0.8025	1.1435	0.3259		

Asia	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.5882	1.3597	1.8168	1.1634	1.0227	1.3493
1		0.7857	0.2228	1.3486	0.9750	0.7068	1.5707
Diff (1-2)	Pooled	0.8025	0.1569	1.4481	1.1435	1.0124	1.3139
Diff (1-2)	Satterthwaite	0.8025	0.2051	1.3999			

Method	Variances	DF	t Value	Pr > abs(t)
Pooled	Equal	114	2.46	0.0153
Satterthwaite	Unequal	18.487	2.82	0.0112

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The TTEST Procedure

Variable: d_Net_co_Skype

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	101	13	1.42	0.4858

Variable: a_Int_resist

Asia	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	102	1.6471	1.0210	0.1011	0	3.0000
1	14	2.0000	1.1767	0.3145	0	3.0000
Diff (1-2)		-0.3529	1.0400	0.2964		

Asia	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.6471	1.4465	1.8476	1.0210	0.8976	1.1842
1		2.0000	1.3206	2.6794	1.1767	0.8531	1.8957
Diff (1-2)	Pooled	-0.3529	-0.9401	0.2342	1.0400	0.9207	1.1950
Diff (1-2)	Satterthwaite	-0.3529	-1.0539	0.3480			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-1.19	0.2362
Satterthwaite	Unequal	15.804	-1.07	0.3014

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	13	101	1.33	0.4186

Variable: b_Out_date_bus

Asia	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	102	2.4216	0.8258	0.0818	0	3.0000
1	14	1.5000	0.9405	0.2514	0	3.0000
Diff (1-2)		0.9216	0.8397	0.2393		

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Variable: b_Out_date_bus

Asia	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		2.4216	2.2594	2.5838	0.8258	0.7259	0.9577
1		1.5000	0.9569	2.0431	0.9405	0.6818	1.5152
Diff (1-2)	Pooled	0.9216	0.4475	1.3956	0.8397	0.7434	0.9648
Diff (1-2)	Satterthwaite	0.9216	0.3608	1.4823			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	3.85	0.0002
Satterthwaite	Unequal	15.874	3.49	0.0031

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	13	101	1.30	0.4539

Variable: c_Erod_profit

Asia	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	102	1.1863	0.9620	0.0952	0	3.0000
1	14	1.6429	1.0818	0.2891	0	3.0000
Diff (1-2)		-0.4566	0.9764	0.2783		

Asia	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.1863	0.9973	1.3752	0.9620	0.8456	1.1157
1		1.6429	1.0182	2.2675	1.0818	0.7843	1.7429
Diff (1-2)	Pooled	-0.4566	-1.0078	0.0947	0.9764	0.8644	1.1219
Diff (1-2)	Satterthwaite	-0.4566	-1.1021	0.1889			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-1.64	0.1036
Satterthwaite	Unequal	15.951	-1.50	0.1532

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	13	101	1.26	0.4937

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The TTEST Procedure

Variable: d_Much_reg

```
         Asia            N        Mean     Std Dev     Std Err     Minimum     Maximum

         0             102      0.7451      0.9194      0.0910           0      3.0000
         1              14      0.8571      1.0995      0.2938           0      3.0000
         Diff (1-2)            -0.1120      0.9417      0.2684

 Asia         Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                               0.7451      0.5645   0.9257      0.9194      0.8082   1.0663
 1                               0.8571      0.2223   1.4919      1.0995      0.7971   1.7713
 Diff (1-2)   Pooled            -0.1120     -0.6437   0.4196      0.9417      0.8337   1.0820
 Diff (1-2)   Satterthwaite     -0.1120     -0.7655   0.5415

                  Method           Variances        DF    t Value    Pr > |t|

                  Pooled           Equal           114      -0.42      0.6771
                  Satterthwaite    Unequal      15.597      -0.36      0.7206

                                   Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F        13       101       1.43    0.3173


                                 Variable:  a_Mod_scalable

         Asia            N        Mean     Std Dev     Std Err     Minimum     Maximum

         0             102      2.1667      0.8569      0.0848           0      3.0000
         1              14      2.2857      0.8254      0.2206      1.0000      3.0000
         Diff (1-2)            -0.1190      0.8534      0.2432

 Asia         Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                               2.1667      1.9984   2.3350      0.8569      0.7533   0.9939
 1                               2.2857      1.8091   2.7623      0.8254      0.5984   1.3298
 Diff (1-2)   Pooled            -0.1190     -0.6009   0.3628      0.8534      0.7555   0.9806
 Diff (1-2)   Satterthwaite     -0.1190     -0.6175   0.3794

                  Method           Variances        DF    t Value    Pr > |t|

                  Pooled           Equal           114      -0.49      0.6255
                  Satterthwaite    Unequal      17.083      -0.50      0.6209
```

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                                 Variable:  a_Mod_scalable

                                   Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F       101        13       1.08    0.9449


                                 Variable:  b_One_stop_shop

         Asia            N        Mean     Std Dev     Std Err     Minimum     Maximum

         0             102      1.7941      1.0373      0.1027           0      3.0000
         1              14      2.0714      0.9972      0.2665           0      3.0000
         Diff (1-2)            -0.2773      1.0328      0.2944

 Asia         Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                               1.7941      1.5904   1.9979      1.0373      0.9119   1.2031
 1                               2.0714      1.4956   2.6472      0.9972      0.7230   1.6066
 Diff (1-2)   Pooled            -0.2773     -0.8604   0.3058      1.0328      0.9144   1.1868
 Diff (1-2)   Satterthwaite     -0.2773     -0.8797   0.3251

                  Method           Variances        DF    t Value    Pr > |t|

                  Pooled           Equal           114      -0.94      0.3482
                  Satterthwaite    Unequal      17.099      -0.97      0.3451

                                   Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F       101        13       1.08    0.9378
```

```
                                 Variable:  c_Lean_org

             Asia             N        Mean     Std Dev     Std Err     Minimum     Maximum

             0              102      1.6471      0.9297      0.0921           0      3.0000
             1               14      1.2143      0.8018      0.2143           0      3.0000
             Diff (1-2)              0.4328      0.9160      0.2611
```

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                                 Variable:  c_Lean_org

     Asia          Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

     0                                1.6471      1.4645   1.8297      0.9297      0.8173   1.0783
     1                                1.2143      0.7513   1.6772      0.8018      0.5813   1.2917
     Diff (1-2)    Pooled             0.4328     -0.0844   0.9500      0.9160      0.8110   1.0525
     Diff (1-2)    Satterthwaite      0.4328     -0.0569   0.9224

                      Method           Variances        DF    t Value    Pr > |t|

                      Pooled           Equal           114       1.66      0.1001
                      Satterthwaite    Unequal      18.161       1.86      0.0798

                                 Equality of Variances

                           Method      Num DF    Den DF    F Value    Pr > F

                           Folded F       101        13       1.34    0.5678


                               Variable:  d_Max_cont_mono

             Asia             N        Mean     Std Dev     Std Err     Minimum     Maximum

             0              102      0.3922      0.7598      0.0752           0      3.0000
             1               14      0.4286      0.8516      0.2276           0      2.0000
             Diff (1-2)             -0.0364      0.7709      0.2197

     Asia          Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

     0                                0.3922      0.2429   0.5414      0.7598      0.6680   0.8813
     1                                0.4286     -0.0631   0.9203      0.8516      0.6174   1.3720
     Diff (1-2)    Pooled            -0.0364     -0.4717   0.3988      0.7709      0.6825   0.8858
     Diff (1-2)    Satterthwaite     -0.0364     -0.5447   0.4718

                      Method           Variances        DF    t Value    Pr > |t|

                      Pooled           Equal           114      -0.17      0.8687
                      Satterthwaite    Unequal      15.972      -0.15      0.8812

                                 Equality of Variances

                           Method      Num DF    Den DF    F Value    Pr > F

                           Folded F        13       101       1.26    0.5046
```

Background Bias: Emerging Markets t-test

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                                          The TTEST Procedure

                                       Variable:  a_Existing_rel

        Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              80      2.0625      1.1063      0.1237           0      3.0000
        1              36      1.7222      1.0586      0.1764           0      3.0000
        Diff (1-2)             0.3403      1.0919      0.2191

Emerge       Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               2.0625      1.8163   2.3087      1.1063      0.9574   1.3104
1                               1.7222      1.3640   2.0804      1.0586      0.8586   1.3809
Diff (1-2)   Pooled             0.3403     -0.0938   0.7744      1.0919      0.9667   1.2546
Diff (1-2)   Satterthwaite      0.3403     -0.0894   0.7700

                Method           Variances        DF    t Value    Pr > |t|

                Pooled           Equal           114       1.55      0.1232
                Satterthwaite    Unequal       70.33       1.58      0.1188

                                         Equality of Variances

                     Method      Num DF    Den DF    F Value    Pr > F

                     Folded F        79        35       1.09    0.7897


                                       Variable:  b_Own_phys_net

        Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              80      1.3875      1.0613      0.1187           0      3.0000
        1              36      1.2500      1.0522      0.1754           0      3.0000
        Diff (1-2)             0.1375      1.0585      0.2124

Emerge       Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.3875      1.1513   1.6237      1.0613      0.9185   1.2571
1                               1.2500      0.8940   1.6060      1.0522      0.8534   1.3725
Diff (1-2)   Pooled             0.1375     -0.2833   0.5583      1.0585      0.9372   1.2163
Diff (1-2)   Satterthwaite      0.1375     -0.2850   0.5600

                Method           Variances        DF    t Value    Pr > |t|

                Pooled           Equal           114       0.65      0.5188
                Satterthwaite    Unequal      68.064       0.65      0.5183
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                                          The TTEST Procedure

                                       Variable:  b_Own_phys_net

                                         Equality of Variances

                     Method      Num DF    Den DF    F Value    Pr > F

                     Folded F        79        35       1.02    0.9819


                                          Variable:  c_Fin_str

        Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              80      1.5000      1.0063      0.1125           0      3.0000
        1              36      1.6111      1.0496      0.1749           0      3.0000
        Diff (1-2)            -0.1111      1.0198      0.2047

Emerge       Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.5000      1.2761   1.7239      1.0063      0.8709   1.1919
1                               1.6111      1.2560   1.9662      1.0496      0.8513   1.3691
Diff (1-2)   Pooled            -0.1111     -0.5165   0.2943      1.0198      0.9029   1.1718
Diff (1-2)   Satterthwaite     -0.1111     -0.5265   0.3043

                Method           Variances        DF    t Value    Pr > |t|
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                Pooled           Equal           114      -0.54      0.5883
                Satterthwaite    Unequal      65.017      -0.53      0.5950

                                   Equality of Variances

                     Method      Num DF    Den DF    F Value    Pr > F

                     Folded F        35        79       1.09    0.7411


                                   Variable:  d_Reput_exp

        Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              80      1.0500      1.0780      0.1205           0      3.0000
        1              36      1.4167      1.2956      0.2159           0      3.0000
        Diff (1-2)            -0.3667      1.1492      0.2306
```

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                                   The TTEST Procedure

                                   Variable:  d_Reput_exp

Emerge        Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.0500      0.8101   1.2899      1.0780      0.9329   1.2768
1                               1.4167      0.9783   1.8550      1.2956      1.0508   1.6900
Diff (1-2)    Pooled           -0.3667     -0.8235   0.0902      1.1492      1.0174   1.3205
Diff (1-2)    Satterthwaite    -0.3667     -0.8617   0.1284

                Method           Variances        DF    t Value    Pr > |t|

                Pooled           Equal           114      -1.59      0.1146
                Satterthwaite    Unequal      57.721      -1.48      0.1436

                                   Equality of Variances

                     Method      Num DF    Den DF    F Value    Pr > F

                     Folded F        35        79       1.44    0.1805


                                 Variable:  a_Outdated_net

        Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              80      1.6625      1.0667      0.1193           0      3.0000
        1              36      1.5833      1.0247      0.1708           0      3.0000
        Diff (1-2)             0.0792      1.0540      0.2115

Emerge        Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.6625      1.4251   1.8999      1.0667      0.9232   1.2635
1                               1.5833      1.2366   1.9300      1.0247      0.8311   1.3367
Diff (1-2)    Pooled            0.0792     -0.3399   0.4982      1.0540      0.9331   1.2111
Diff (1-2)    Satterthwaite     0.0792     -0.3363   0.4946

                Method           Variances        DF    t Value    Pr > |t|

                Pooled           Equal           114       0.37      0.7089
                Satterthwaite    Unequal      70.075       0.38      0.7051

                                   Equality of Variances

                     Method      Num DF    Den DF    F Value    Pr > F

                     Folded F        79        35       1.08    0.8104
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                                   The TTEST Procedure

                                 Variable:  b_Low_serv_qual

        Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              80      2.0250      1.1248      0.1258           0      3.0000
        1              36      2.4167      0.7700      0.1283      1.0000      3.0000
        Diff (1-2)            -0.3917      1.0290      0.2065

Emerge        Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev
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0                               2.0250      1.7747   2.2753      1.1248      0.9735   1.3323
1                               2.4167      2.1561   2.6772      0.7700      0.6245   1.0044
Diff (1-2)    Pooled           -0.3917     -0.8008   0.0174      1.0290      0.9110   1.1823
Diff (1-2)    Satterthwaite    -0.3917     -0.7483  -0.0350

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -1.90      0.0604
                 Satterthwaite    Unequal      95.487      -2.18      0.0317

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        79        35       2.13    0.0144


                                  Variable:  c_Expen_telec

        Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              80      1.0875      0.9704      0.1085           0      3.0000
        1              36      0.8333      0.8783      0.1464           0      3.0000
        Diff (1-2)             0.2542      0.9431      0.1893

Emerge        Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.0875      0.8716   1.3034      0.9704      0.8398   1.1494
1                               0.8333      0.5362   1.1305      0.8783      0.7124   1.1457
Diff (1-2)    Pooled            0.2542     -0.1208   0.6291      0.9431      0.8349   1.0836
Diff (1-2)    Satterthwaite     0.2542     -0.1089   0.6172

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       1.34      0.1820
                 Satterthwaite    Unequal      74.104       1.39      0.1672
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                                   The TTEST Procedure

                                  Variable:  c_Expen_telec

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        79        35       1.22    0.5191


                                  Variable:  d_Limit_rigid

        Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              80      1.2250      1.0789      0.1206           0      3.0000
        1              36      1.1667      1.1339      0.1890           0      3.0000
        Diff (1-2)             0.0583      1.0960      0.2200

Emerge        Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.2250      0.9849   1.4651      1.0789      0.9337   1.2779
1                               1.1667      0.7830   1.5503      1.1339      0.9197   1.4791
Diff (1-2)    Pooled            0.0583     -0.3774   0.4941      1.0960      0.9704   1.2594
Diff (1-2)    Satterthwaite     0.0583     -0.3895   0.5061

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.27      0.7913
                 Satterthwaite    Unequal      64.577       0.26      0.7955

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        35        79       1.10    0.7009


                               Variable:  a_Oth_telcos_attack

        Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              80      1.5000      0.9678      0.1082           0      3.0000
        1              36      2.1667      0.7368      0.1228      1.0000      3.0000
        Diff (1-2)            -0.6667      0.9032      0.1813
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                           Variable:  a_Oth_telcos_attack

Emerge        Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.5000      1.2846   1.7154      0.9678      0.8376   1.1464
1                               2.1667      1.9174   2.4160      0.7368      0.5976   0.9611
Diff (1-2)    Pooled           -0.6667     -1.0258  -0.3076      0.9032      0.7996   1.0378
Diff (1-2)    Satterthwaite    -0.6667     -0.9920  -0.3414

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -3.68      0.0004
                 Satterthwaite    Unequal      87.171      -4.07      0.0001

                              Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        79        35       1.73    0.0749


                            Variable:  b_Cable_Sat_Wire

        Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              80      2.1875      0.7970      0.0891           0      3.0000
        1              36      1.7500      0.9063      0.1511           0      3.0000
        Diff (1-2)             0.4375      0.8321      0.1670

Emerge        Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               2.1875      2.0101   2.3649      0.7970      0.6898   0.9441
1                               1.7500      1.4433   2.0567      0.9063      0.7351   1.1822
Diff (1-2)    Pooled            0.4375      0.1067   0.7683      0.8321      0.7367   0.9562
Diff (1-2)    Satterthwaite     0.4375      0.0867   0.7883

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       2.62      0.0100
                 Satterthwaite    Unequal      60.362       2.49      0.0154

                              Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        35        79       1.29    0.3464
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                            Variable:  c_Equip_vend_sys

        Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              80      0.5625      0.7931      0.0887           0      3.0000
        1              36      0.3611      0.5929      0.0988           0      2.0000
        Diff (1-2)             0.2014      0.7374      0.1480

Emerge        Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               0.5625      0.3860   0.7390      0.7931      0.6864   0.9394
1                               0.3611      0.1605   0.5617      0.5929      0.4809   0.7735
Diff (1-2)    Pooled            0.2014     -0.0918   0.4946      0.7374      0.6529   0.8473
Diff (1-2)    Satterthwaite     0.2014     -0.0624   0.4652

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       1.36      0.1763
                 Satterthwaite    Unequal      88.596       1.52      0.1329

                              Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        79        35       1.79    0.0580


                              Variable:  d_Co_understa
```

Emerge	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	80	1.7500	1.1960	0.1337	0	3.0000
1	36	1.7222	1.2331	0.2055	0	3.0000
Diff (1-2)		0.0278	1.2075	0.2423		

Emerge	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.7500	1.4838	2.0162	1.1960	1.0351	1.4166
1		1.7222	1.3050	2.1395	1.2331	1.0002	1.6086
Diff (1-2)	Pooled	0.0278	-0.4523	0.5079	1.2075	1.0691	1.3875
Diff (1-2)	Satterthwaite	0.0278	-0.4618	0.5174			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.11	0.9089
Satterthwaite	Unequal	65.687	0.11	0.9101

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The TTEST Procedure

Variable: d_Co_understa

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	35	79	1.06	0.8026

Variable: a_Bus_serv_cloud

Emerge	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	80	2.2625	0.8965	0.1002	0	3.0000
1	36	2.3056	0.8886	0.1481	0	3.0000
Diff (1-2)		-0.0431	0.8941	0.1794		

Emerge	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		2.2625	2.0630	2.4620	0.8965	0.7758	1.0618
1		2.3056	2.0049	2.6062	0.8886	0.7208	1.1592
Diff (1-2)	Pooled	-0.0431	-0.3985	0.3124	0.8941	0.7915	1.0273
Diff (1-2)	Satterthwaite	-0.0431	-0.3999	0.3138			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-0.24	0.8108
Satterthwaite	Unequal	68.072	-0.24	0.8105

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	79	35	1.02	0.9812

Variable: b_Ultra_speed_Inter

Emerge	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	80	1.3125	1.0505	0.1175	0	3.0000
1	36	1.1944	1.0091	0.1682	0	3.0000
Diff (1-2)		0.1181	1.0380	0.2083		

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Variable: b_Ultra_speed_Inter

Emerge	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.3125	1.0787	1.5463	1.0505	0.9092	1.2443
1		1.1944	0.8530	1.5359	1.0091	0.8185	1.3163
Diff (1-2)	Pooled	0.1181	-0.2946	0.5307	1.0380	0.9190	1.1927
Diff (1-2)	Satterthwaite	0.1181	-0.2911	0.5272			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.57	0.5720
Satterthwaite	Unequal	70.081	0.58	0.5668

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	79	35	1.08	0.8099

Variable: c_New_revenues

Emerge	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	80	1.6500	0.9691	0.1084	0	3.0000
1	36	1.9444	0.9545	0.1591	0	3.0000
Diff (1-2)		-0.2944	0.9647	0.1936		

Emerge	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.6500	1.4343	1.8657	0.9691	0.8387	1.1479
1		1.9444	1.6215	2.2674	0.9545	0.7742	1.2451
Diff (1-2)	Pooled	-0.2944	-0.6780	0.0891	0.9647	0.8541	1.1085
Diff (1-2)	Satterthwaite	-0.2944	-0.6785	0.0896			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-1.52	0.1311
Satterthwaite	Unequal	68.476	-1.53	0.1307

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	79	35	1.03	0.9457

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Variable: d_Smart_home_sol

Emerge	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	80	0.7750	1.0185	0.1139	0	3.0000
1	36	0.5556	0.7346	0.1224	0	2.0000
Diff (1-2)		0.2194	0.9405	0.1888		

Emerge	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.7750	0.5483	1.0017	1.0185	0.8815	1.2064
1		0.5556	0.3070	0.8041	0.7346	0.5958	0.9583
Diff (1-2)	Pooled	0.2194	-0.1545	0.5934	0.9405	0.8327	1.0807
Diff (1-2)	Satterthwaite	0.2194	-0.1127	0.5516			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	1.16	0.2474
Satterthwaite	Unequal	91.428	1.31	0.1927

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	79	35	1.92	0.0338

Variable: a_Invest_net

Emerge	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	80	1.9250	1.1776	0.1317	0	3.0000
1	36	1.8056	1.1909	0.1985	0	3.0000
Diff (1-2)		0.1194	1.1817	0.2372		

Emerge	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.9250	1.6629	2.1871	1.1776	1.0191	1.3948
1		1.8056	1.4026	2.2085	1.1909	0.9659	1.5535
Diff (1-2)	Pooled	0.1194	-0.3504	0.5893	1.1817	1.0462	1.3578
Diff (1-2)	Satterthwaite	0.1194	-0.3560	0.5949			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.50	0.6155
Satterthwaite	Unequal	66.842	0.50	0.6177

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                               Variable:  a_Invest_net

                                Equality of Variances

                   Method      Num DF    Den DF    F Value    Pr > F

                   Folded F        35        79       1.02    0.9083


                              Variable:  b_Use_billing_rel

         Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              80      1.0625      1.0595      0.1185           0      3.0000
         1              36      1.0278      1.1335      0.1889           0      3.0000
         Diff (1-2)             0.0347      1.0828      0.2173

 Emerge        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                                1.0625      0.8267   1.2983      1.0595      0.9170   1.2550
 1                                1.0278      0.6442   1.4113      1.1335      0.9194   1.4786
 Diff (1-2)    Pooled             0.0347     -0.3958   0.4652      1.0828      0.9586   1.2442
 Diff (1-2)    Satterthwaite      0.0347     -0.4108   0.4803

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.16      0.8733
                 Satterthwaite    Unequal      63.578       0.16      0.8768

                                Equality of Variances

                   Method      Num DF    Den DF    F Value    Pr > F

                   Folded F        35        79       1.14    0.6108


                              Variable:  c_Gen_rev_Wholes

         Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              80      1.2750      0.9543      0.1067           0      3.0000
         1              36      1.1944      0.8559      0.1426           0      3.0000
         Diff (1-2)             0.0806      0.9252      0.1857
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                              Variable:  c_Gen_rev_Wholes

 Emerge        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                                1.2750      1.0626   1.4874      0.9543      0.8259   1.1304
 1                                1.1944      0.9049   1.4840      0.8559      0.6942   1.1164
 Diff (1-2)    Pooled             0.0806     -0.2873   0.4484      0.9252      0.8191   1.0631
 Diff (1-2)    Satterthwaite      0.0806     -0.2743   0.4354

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.43      0.6652
                 Satterthwaite    Unequal      74.753       0.45      0.6524

                                Equality of Variances

                   Method      Num DF    Den DF    F Value    Pr > F

                   Folded F        79        35       1.24    0.4797


                             Variable:  d_Converge_net_serv

         Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              80      1.7375      1.0761      0.1203           0      3.0000
         1              36      1.9722      1.0278      0.1713           0      3.0000
         Diff (1-2)            -0.2347      1.0615      0.2130

 Emerge        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev
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0                                1.7375      1.4980   1.9770      1.0761      0.9313   1.2747
1                                1.9722      1.6245   2.3200      1.0278      0.8336   1.3407
Diff (1-2)    Pooled            -0.2347     -0.6568   0.1873      1.0615      0.9398   1.2198
Diff (1-2)    Satterthwaite     -0.2347     -0.6522   0.1827

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -1.10      0.2729
                 Satterthwaite    Unequal      70.455      -1.12      0.2660

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        79        35       1.10    0.7797
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                                 Variable:  a_Access_Net

        Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              80      2.1125      1.1023      0.1232           0      3.0000
        1              36      1.7222      1.0586      0.1764           0      3.0000
        Diff (1-2)             0.3903      1.0891      0.2186

Emerge        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                2.1125      1.8672   2.3578      1.1023      0.9540   1.3056
1                                1.7222      1.3640   2.0804      1.0586      0.8586   1.3809
Diff (1-2)    Pooled             0.3903     -0.0427   0.8233      1.0891      0.9642   1.2514
Diff (1-2)    Satterthwaite      0.3903     -0.0389   0.8195

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       1.79      0.0768
                 Satterthwaite    Unequal      70.093       1.81      0.0740

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        79        35       1.08    0.8089


                                   Variable:  b_Core_Net

        Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              80      1.4250      1.0284      0.1150           0      3.0000
        1              36      1.2778      1.0586      0.1764           0      3.0000
        Diff (1-2)             0.1472      1.0378      0.2083

Emerge        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.4250      1.1961   1.6539      1.0284      0.8900   1.2181
1                                1.2778      0.9196   1.6360      1.0586      0.8586   1.3809
Diff (1-2)    Pooled             0.1472     -0.2654   0.5598      1.0378      0.9188   1.1924
Diff (1-2)    Satterthwaite      0.1472     -0.2733   0.5677

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.71      0.4811
                 Satterthwaite    Unequal      65.784       0.70      0.4870
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                                   Variable:  b_Core_Net

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        35        79       1.06    0.8115


                                 Variable:  c_Service_Apps

        Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum
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```
        0              80      1.7750      0.9543      0.1067           0      3.0000
        1              36      1.9722      1.1335      0.1889           0      3.0000
        Diff (1-2)            -0.1972      1.0127      0.2032

Emerge       Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                              1.7750      1.5626   1.9874      0.9543      0.8259   1.1304
1                              1.9722      1.5887   2.3558      1.1335      0.9194   1.4786
Diff (1-2)   Pooled           -0.1972     -0.5999   0.2054      1.0127      0.8966   1.1637
Diff (1-2)   Satterthwaite    -0.1972     -0.6315   0.2371

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.97      0.3339
                 Satterthwaite    Unequal      58.262      -0.91      0.3671

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        35        79       1.41    0.2098


                                  Variable:  d_QoS_monitor

        Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              80      0.6875      0.8656      0.0968           0      3.0000
        1              36      1.0278      1.0278      0.1713           0      3.0000
        Diff (1-2)            -0.3403      0.9184      0.1843
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                                  Variable:  d_QoS_monitor

Emerge       Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                              0.6875      0.4949   0.8801      0.8656      0.7491   1.0252
1                              1.0278      0.6800   1.3755      1.0278      0.8336   1.3407
Diff (1-2)   Pooled           -0.3403     -0.7054   0.0249      0.9184      0.8131   1.0553
Diff (1-2)   Satterthwaite    -0.3403     -0.7341   0.0535

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -1.85      0.0675
                 Satterthwaite    Unequal      58.276      -1.73      0.0890

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        35        79       1.41    0.2106


                               Variable:  a_Strategic_collab

        Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              80      1.4875      0.9807      0.1097           0      3.0000
        1              36      1.6944      1.0370      0.1728           0      3.0000
        Diff (1-2)            -0.2069      0.9984      0.2004

Emerge       Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                              1.4875      1.2692   1.7058      0.9807      0.8488   1.1617
1                              1.6944      1.3436   2.0453      1.0370      0.8411   1.3527
Diff (1-2)   Pooled           -0.2069     -0.6039   0.1900      0.9984      0.8839   1.1472
Diff (1-2)   Satterthwaite    -0.2069     -0.6158   0.2019

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -1.03      0.3039
                 Satterthwaite    Unequal      64.234      -1.01      0.3158

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        35        79       1.12    0.6698
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                      Variable:  b_Effective_regul

        Emerge         N        Mean     Std Dev     Std Err     Minimum     Maximum

        0             80      0.8125      1.0685      0.1195           0      3.0000
        1             36      0.7778      1.0173      0.1696           0      3.0000
        Diff (1-2)            0.0347      1.0530      0.2113

Emerge       Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               0.8125      0.5747   1.0503      1.0685      0.9247   1.2656
1                               0.7778      0.4336   1.1220      1.0173      0.8251   1.3270
Diff (1-2)   Pooled             0.0347     -0.3839   0.4534      1.0530      0.9323   1.2100
Diff (1-2)   Satterthwaite      0.0347     -0.3789   0.4483

                Method           Variances        DF    t Value    Pr > |t|

                Pooled           Equal           114       0.16      0.8698
                Satterthwaite    Unequal      70.658       0.17      0.8675

                          Equality of Variances

                     Method      Num DF    Den DF    F Value    Pr > F

                     Folded F        79        35       1.10    0.7635


                        Variable:  c_Cont_invest

        Emerge         N        Mean     Std Dev     Std Err     Minimum     Maximum

        0             80      2.1625      0.9063      0.1013           0      3.0000
        1             36      1.8889      1.0359      0.1726           0      3.0000
        Diff (1-2)            0.2736      0.9480      0.1902

Emerge       Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               2.1625      1.9608   2.3642      0.9063      0.7844   1.0735
1                               1.8889      1.5384   2.2394      1.0359      0.8402   1.3512
Diff (1-2)   Pooled             0.2736     -0.1033   0.6505      0.9480      0.8393   1.0893
Diff (1-2)   Satterthwaite      0.2736     -0.1268   0.6740

                Method           Variances        DF    t Value    Pr > |t|

                Pooled           Equal           114       1.44      0.1531
                Satterthwaite    Unequal      60.106       1.37      0.1768
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                        Variable:  c_Cont_invest

                          Equality of Variances

                     Method      Num DF    Den DF    F Value    Pr > F

                     Folded F        35        79       1.31    0.3279


                       Variable:  d_Bundling_serv

        Emerge         N        Mean     Std Dev     Std Err     Minimum     Maximum

        0             80      1.5375      1.1017      0.1232           0      3.0000
        1             36      1.6389      1.0994      0.1832           0      3.0000
        Diff (1-2)           -0.1014      1.1010      0.2210

Emerge       Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.5375      1.2923   1.7827      1.1017      0.9535   1.3049
1                               1.6389      1.2669   2.0109      1.0994      0.8917   1.4341
Diff (1-2)   Pooled            -0.1014     -0.5391   0.3363      1.1010      0.9748   1.2651
Diff (1-2)   Satterthwaite     -0.1014     -0.5420   0.3392

                Method           Variances        DF    t Value    Pr > |t|

                Pooled           Equal           114      -0.46      0.6472
                Satterthwaite    Unequal      67.657      -0.46      0.6476

                          Equality of Variances
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                   Method      Num DF    Den DF    F Value    Pr > F

                   Folded F        79        35       1.00    1.0000


                              Variable:  a_Sys_vend_integ

     Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

     0              80      1.4500      1.1352      0.1269           0      3.0000
     1              36      1.4167      1.1307      0.1885           0      3.0000
     Diff (1-2)             0.0333      1.1338      0.2275
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                              Variable:  a_Sys_vend_integ

Emerge        Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.4500      1.1974   1.7026      1.1352      0.9824   1.3446
1                               1.4167      1.0341   1.7993      1.1307      0.9171   1.4750
Diff (1-2)    Pooled            0.0333     -0.4174   0.4841      1.1338      1.0038   1.3028
Diff (1-2)    Satterthwaite     0.0333     -0.4201   0.4867

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.15      0.8838
                 Satterthwaite    Unequal      67.771       0.15      0.8838

                              Equality of Variances

                   Method      Num DF    Den DF    F Value    Pr > F

                   Folded F        79        35       1.01    1.0000


                            Variable:  b_Oth_oper_wholesale

     Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

     0              80      1.1125      1.0187      0.1139           0      3.0000
     1              36      0.9722      1.0278      0.1713           0      3.0000
     Diff (1-2)             0.1403      1.0215      0.2050

Emerge        Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.1125      0.8858   1.3392      1.0187      0.8817   1.2067
1                               0.9722      0.6245   1.3200      1.0278      0.8336   1.3407
Diff (1-2)    Pooled            0.1403     -0.2659   0.5464      1.0215      0.9044   1.1738
Diff (1-2)    Satterthwaite     0.1403     -0.2703   0.5509

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.68      0.4952
                 Satterthwaite    Unequal      66.988       0.68      0.4976

                              Equality of Variances

                   Method      Num DF    Den DF    F Value    Pr > F

                   Folded F        35        79       1.02    0.9216
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                               Variable:  c_Cont_provid

     Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

     0              80      2.0000      0.9678      0.1082           0      3.0000
     1              36      2.0000      0.9562      0.1594           0      3.0000
     Diff (1-2)                  0      0.9643      0.1935

Emerge        Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               2.0000      1.7846   2.2154      0.9678      0.8376   1.1464
1                               2.0000      1.6765   2.3235      0.9562      0.7755   1.2473
Diff (1-2)    Pooled                 0     -0.3834   0.3834      0.9643      0.8537   1.1080
Diff (1-2)    Satterthwaite          0     -0.3844   0.3844

                 Method           Variances        DF    t Value    Pr > |t|
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                 Pooled           Equal           114       0.00      1.0000
                 Satterthwaite    Unequal      68.282       0.00      1.0000

                                    Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        79        35       1.02    0.9627


                                  Variable:  d_Net_co_Skype

          Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

          0              80      1.4375      1.1783      0.1317           0      3.0000
          1              36      1.6111      1.1533      0.1922           0      3.0000
          Diff (1-2)            -0.1736      1.1707      0.2350

  Emerge        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

  0                                1.4375      1.1753   1.6997      1.1783      1.0198   1.3957
  1                                1.6111      1.2209   2.0013      1.1533      0.9354   1.5044
  Diff (1-2)    Pooled            -0.1736     -0.6391   0.2918      1.1707      1.0365   1.3452
  Diff (1-2)    Satterthwaite     -0.1736     -0.6385   0.2913

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.74      0.4615
                 Satterthwaite    Unequal      68.871      -0.75      0.4588
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                                  Variable:  d_Net_co_Skype

                                    Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        79        35       1.04    0.9115


                                   Variable:  a_Int_resist

          Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

          0              80      1.7000      1.0838      0.1212           0      3.0000
          1              36      1.6667      0.9562      0.1594           0      3.0000
          Diff (1-2)             0.0333      1.0463      0.2100

  Emerge        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

  0                                1.7000      1.4588   1.9412      1.0838      0.9380   1.2838
  1                                1.6667      1.3431   1.9902      0.9562      0.7755   1.2473
  Diff (1-2)    Pooled             0.0333     -0.3826   0.4493      1.0463      0.9263   1.2023
  Diff (1-2)    Satterthwaite      0.0333     -0.3654   0.4321

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.16      0.8742
                 Satterthwaite    Unequal      75.927       0.17      0.8682

                                    Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        79        35       1.28    0.4140


                                  Variable:  b_Out_date_bus

          Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

          0              80      2.2250      0.9137      0.1022           0      3.0000
          1              36      2.5000      0.8106      0.1351           0      3.0000
          Diff (1-2)            -0.2750      0.8833      0.1773
```

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                                  Variable:  b_Out_date_bus
```

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Emerge        Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               2.2250      2.0217   2.4283      0.9137      0.7907   1.0822
1                               2.5000      2.2257   2.7743      0.8106      0.6575   1.0574
Diff (1-2)    Pooled           -0.2750     -0.6262   0.0762      0.8833      0.7820   1.0150
Diff (1-2)    Satterthwaite    -0.2750     -0.6124   0.0624

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -1.55      0.1236
                 Satterthwaite    Unequal       75.52      -1.62      0.1086

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        79        35       1.27    0.4360


                                  Variable:  c_Erod_profit

        Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              80      1.3500      0.9949      0.1112           0      3.0000
        1              36      1.0000      0.9258      0.1543           0      3.0000
        Diff (1-2)             0.3500      0.9742      0.1955

Emerge        Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.3500      1.1286   1.5714      0.9949      0.8611   1.1785
1                               1.0000      0.6867   1.3133      0.9258      0.7509   1.2077
Diff (1-2)    Pooled            0.3500     -0.0373   0.7373      0.9742      0.8625   1.1194
Diff (1-2)    Satterthwaite     0.3500     -0.0292   0.7292

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       1.79      0.0761
                 Satterthwaite    Unequal      72.192       1.84      0.0699

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        79        35       1.15    0.6475
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                                   Variable:  d_Much_reg

        Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              80      0.7250      0.9274      0.1037           0      3.0000
        1              36      0.8333      0.9710      0.1618           0      3.0000
        Diff (1-2)            -0.1083      0.9410      0.1889

Emerge        Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               0.7250      0.5186   0.9314      0.9274      0.8026   1.0985
1                               0.8333      0.5048   1.1619      0.9710      0.7876   1.2666
Diff (1-2)    Pooled           -0.1083     -0.4825   0.2658      0.9410      0.8331   1.0813
Diff (1-2)    Satterthwaite    -0.1083     -0.4922   0.2755

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.57      0.5674
                 Satterthwaite    Unequal      64.797      -0.56      0.5749

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        35        79       1.10    0.7209


                                 Variable:  a_Mod_scalable

        Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              80      2.1500      0.8729      0.0976           0      3.0000
        1              36      2.2500      0.8062      0.1344      1.0000      3.0000
        Diff (1-2)            -0.1000      0.8530      0.1712
```

```
   Emerge        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

   0                                2.1500      1.9557   2.3443      0.8729      0.7555   1.0340
   1                                2.2500      1.9772   2.5228      0.8062      0.6539   1.0517
   Diff (1-2)    Pooled            -0.1000     -0.4391   0.2391      0.8530      0.7552   0.9802
   Diff (1-2)    Satterthwaite     -0.1000     -0.4310   0.2310

                    Method           Variances        DF    t Value    Pr > |t|

                    Pooled           Equal           114      -0.58      0.5603
                    Satterthwaite    Unequal      72.705      -0.60      0.5490
```

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                                       Variable:  a_Mod_scalable

                                         Equality of Variances

                         Method      Num DF    Den DF    F Value    Pr > F

                         Folded F        79        35       1.17    0.6113


                                       Variable:  b_One_stop_shop

           Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

           0              80      1.8375      1.0366      0.1159           0      3.0000
           1              36      1.8056      1.0370      0.1728           0      3.0000
           Diff (1-2)             0.0319      1.0367      0.2081

   Emerge        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

   0                                1.8375      1.6068   2.0682      1.0366      0.8971   1.2278
   1                                1.8056      1.4547   2.1564      1.0370      0.8411   1.3527
   Diff (1-2)    Pooled             0.0319     -0.3802   0.4441      1.0367      0.9178   1.1912
   Diff (1-2)    Satterthwaite      0.0319     -0.3834   0.4472

                    Method           Variances        DF    t Value    Pr > |t|

                    Pooled           Equal           114       0.15      0.8782
                    Satterthwaite    Unequal      67.504       0.15      0.8785

                                         Equality of Variances

                         Method      Num DF    Den DF    F Value    Pr > F

                         Folded F        35        79       1.00    0.9682


                                         Variable:  c_Lean_org

           Emerge          N        Mean     Std Dev     Std Err     Minimum     Maximum

           0              80      1.6000      0.9223      0.1031           0      3.0000
           1              36      1.5833      0.9373      0.1562           0      3.0000
           Diff (1-2)             0.0167      0.9269      0.1860
```

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                                         Variable:  c_Lean_org

   Emerge        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

   0                                1.6000      1.3948   1.8052      0.9223      0.7982   1.0924
   1                                1.5833      1.2662   1.9005      0.9373      0.7602   1.2227
   Diff (1-2)    Pooled             0.0167     -0.3519   0.3852      0.9269      0.8207   1.0651
   Diff (1-2)    Satterthwaite      0.0167     -0.3570   0.3903

                    Method           Variances        DF    t Value    Pr > |t|

                    Pooled           Equal           114       0.09      0.9288
                    Satterthwaite    Unequal      66.546       0.09      0.9293

                                         Equality of Variances

                         Method      Num DF    Den DF    F Value    Pr > F

                         Folded F        35        79       1.03    0.8813
```

Variable: d_Max_cont_mono

Emerge	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	80	0.4125	0.7907	0.0884	0	3.0000
1	36	0.3611	0.7232	0.1205	0	3.0000
Diff (1-2)		0.0514	0.7706	0.1547		

Emerge	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.4125	0.2365	0.5885	0.7907	0.6843	0.9365
1		0.3611	0.1164	0.6058	0.7232	0.5866	0.9434
Diff (1-2)	Pooled	0.0514	-0.2550	0.3578	0.7706	0.6822	0.8854
Diff (1-2)	Satterthwaite	0.0514	-0.2465	0.3493			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.33	0.7403
Satterthwaite	Unequal	73.373	0.34	0.7320

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	79	35	1.20	0.5660

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Variable: a_Existing_rel

Emerge_ Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	101	1.9109	1.1144	0.1109	0	3.0000
1	15	2.2667	0.9612	0.2482	0	3.0000
Diff (1-2)		-0.3558	1.0968	0.3035		

Emerge_ Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.9109	1.6909	2.1309	1.1144	0.9791	1.2936
1		2.2667	1.7344	2.7989	0.9612	0.7037	1.5158
Diff (1-2)	Pooled	-0.3558	-0.9570	0.2454	1.0968	0.9710	1.2602
Diff (1-2)	Satterthwaite	-0.3558	-0.9227	0.2112			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-1.17	0.2435
Satterthwaite	Unequal	20.037	-1.31	0.2054

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	100	14	1.34	0.5486

Variable: b_Own_phys_net

Emerge_ Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	101	1.3960	1.0590	0.1054	0	3.0000
1	15	1.0000	1.0000	0.2582	0	3.0000
Diff (1-2)		0.3960	1.0520	0.2911		

Emerge_ Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.3960	1.1870	1.6051	1.0590	0.9304	1.2293
1		1.0000	0.4462	1.5538	1.0000	0.7321	1.5771
Diff (1-2)	Pooled	0.3960	-0.1806	0.9727	1.0520	0.9314	1.2088
Diff (1-2)	Satterthwaite	0.3960	-0.1877	0.9798			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	1.36	0.1763
Satterthwaite	Unequal	18.979	1.42	0.1718

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Variable: b_Own_phys_net

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	100	14	1.12	0.8600

Variable: c_Fin_str

Emerge_ Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	101	1.5644	1.0336	0.1028	0	3.0000
1	15	1.3333	0.8997	0.2323	0	3.0000
Diff (1-2)		0.2310	1.0181	0.2817		

Emerge_ Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.5644	1.3603	1.7684	1.0336	0.9081	1.1997

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1                              1.3333      0.8351   1.8316      0.8997      0.6587   1.4190
Diff (1-2)    Pooled           0.2310     -0.3271   0.7891      1.0181      0.9014   1.1699
Diff (1-2)    Satterthwaite    0.2310     -0.2991   0.7611

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.82      0.4139
                 Satterthwaite    Unequal      19.918       0.91      0.3740

                                  Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       100        14       1.32    0.5773


                                  Variable:  d_Reput_exp

        Emerge_
        Oper             N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              101      1.1287      1.1372      0.1132           0      3.0000
        1               15      1.4000      1.2984      0.3352           0      3.0000
        Diff (1-2)             -0.2713      1.1582      0.3205
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                                  Variable:  d_Reput_exp

Emerge_
Oper          Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                              1.1287      0.9042   1.3532      1.1372      0.9991   1.3200
1                              1.4000      0.6810   2.1190      1.2984      0.9506   2.0476
Diff (1-2)    Pooled          -0.2713     -0.9062   0.3636      1.1582      1.0254   1.3309
Diff (1-2)    Satterthwaite   -0.2713     -1.0167   0.4741

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.85      0.3991
                 Satterthwaite    Unequal      17.341      -0.77      0.4535

                                  Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        14       100       1.30    0.4377


                                Variable:  a_Outdated_net

        Emerge_
        Oper             N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              101      1.6436      1.0638      0.1059           0      3.0000
        1               15      1.6000      0.9856      0.2545           0      3.0000
        Diff (1-2)              0.0436      1.0545      0.2918

Emerge_
Oper          Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                              1.6436      1.4336   1.8536      1.0638      0.9346   1.2348
1                              1.6000      1.0542   2.1458      0.9856      0.7216   1.5544
Diff (1-2)    Pooled           0.0436     -0.5345   0.6216      1.0545      0.9336   1.2117
Diff (1-2)    Satterthwaite    0.0436     -0.5329   0.6201

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.15      0.8816
                 Satterthwaite    Unequal      19.183       0.16      0.8761

                                  Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       100        14       1.16    0.7897
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                                Variable:  b_Low_serv_qual
```

Emerge_ Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	101	2.0891	1.0686	0.1063	0	3.0000
1	15	2.5333	0.7432	0.1919	1.0000	3.0000
Diff (1-2)		-0.4442	1.0342	0.2862		

Emerge_ Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		2.0891	1.8781	2.3001	1.0686	0.9388	1.2404
1		2.5333	2.1217	2.9449	0.7432	0.5441	1.1721
Diff (1-2)	Pooled	-0.4442	-1.0111	0.1227	1.0342	0.9156	1.1884
Diff (1-2)	Satterthwaite	-0.4442	-0.8974	0.00898			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-1.55	0.1234
Satterthwaite	Unequal	23.605	-2.02	0.0543

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	100	14	2.07	0.1259

Variable: c_Expen_telec

Emerge_ Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	101	1.0594	0.9573	0.0953	0	3.0000
1	15	0.6667	0.8165	0.2108	0	2.0000
Diff (1-2)		0.3927	0.9411	0.2604		

Emerge_ Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.0594	0.8704	1.2484	0.9573	0.8410	1.1112
1		0.6667	0.2145	1.1188	0.8165	0.5978	1.2877
Diff (1-2)	Pooled	0.3927	-0.1232	0.9086	0.9411	0.8332	1.0814
Diff (1-2)	Satterthwaite	0.3927	-0.0895	0.8750			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	1.51	0.1343
Satterthwaite	Unequal	20.182	1.70	0.1049

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Variable: c_Expen_telec

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	100	14	1.37	0.5154

Variable: d_Limit_rigid

Emerge_ Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	101	1.2079	1.0983	0.1093	0	3.0000
1	15	1.2000	1.0823	0.2795	0	3.0000
Diff (1-2)		0.00792	1.0964	0.3034		

Emerge_ Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.2079	0.9911	1.4247	1.0983	0.9649	1.2749
1		1.2000	0.6006	1.7994	1.0823	0.7924	1.7069
Diff (1-2)	Pooled	0.00792	-0.5931	0.6089	1.0964	0.9707	1.2598
Diff (1-2)	Satterthwaite	0.00792	-0.6212	0.6370			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.03	0.9792
Satterthwaite	Unequal	18.549	0.03	0.9792

```
                              Equality of Variances

                Method      Num DF    Den DF    F Value    Pr > F

                Folded F       100        14       1.03    1.0000


                          Variable:  a_Oth_telcos_attack

        Emerge_
        Oper            N        Mean     Std Dev     Std Err     Minimum     Maximum

        0             101      1.6139      0.9589      0.0954           0      3.0000
        1              15      2.3333      0.6172      0.1594      1.0000      3.0000
        Diff (1-2)            -0.7195      0.9237      0.2556
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                          Variable:  a_Oth_telcos_attack

Emerge_
Oper          Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.6139      1.4246   1.8032      0.9589      0.8424   1.1130
1                               2.3333      1.9915   2.6751      0.6172      0.4519   0.9734
Diff (1-2)    Pooled           -0.7195     -1.2258  -0.2131      0.9237      0.8178   1.0614
Diff (1-2)    Satterthwaite    -0.7195     -1.1017  -0.3372

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -2.81      0.0058
                 Satterthwaite    Unequal      25.378      -3.87      0.0007

                              Equality of Variances

                Method      Num DF    Den DF    F Value    Pr > F

                Folded F       100        14       2.41    0.0656


                           Variable:  b_Cable_Sat_Wire

        Emerge_
        Oper            N        Mean     Std Dev     Std Err     Minimum     Maximum

        0             101      2.0891      0.8614      0.0857           0      3.0000
        1              15      1.8000      0.7746      0.2000      1.0000      3.0000
        Diff (1-2)             0.2891      0.8512      0.2355

Emerge_
Oper          Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               2.0891      1.9191   2.2592      0.8614      0.7568   0.9998
1                               1.8000      1.3710   2.2290      0.7746      0.5671   1.2216
Diff (1-2)    Pooled            0.2891     -0.1775   0.7557      0.8512      0.7536   0.9781
Diff (1-2)    Satterthwaite     0.2891     -0.1655   0.7437

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       1.23      0.2222
                 Satterthwaite    Unequal      19.522       1.33      0.1993

                              Equality of Variances

                Method      Num DF    Den DF    F Value    Pr > F

                Folded F       100        14       1.24    0.6840
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                           Variable:  c_Equip_vend_sys

        Emerge_
        Oper            N        Mean     Std Dev     Std Err     Minimum     Maximum

        0             101      0.5347      0.7690      0.0765           0      3.0000
        1              15      0.2667      0.4577      0.1182           0      1.0000
        Diff (1-2)             0.2680      0.7378      0.2042
```

Emerge_ Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.5347	0.3829	0.6865	0.7690	0.6756	0.8926
1		0.2667	0.0132	0.5202	0.4577	0.3351	0.7219
Diff (1-2)	Pooled	0.2680	-0.1365	0.6724	0.7378	0.6532	0.8478
Diff (1-2)	Satterthwaite	0.2680	-0.0206	0.5566			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	1.31	0.1920
Satterthwaite	Unequal	27.518	1.90	0.0675

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	100	14	2.82	0.0321

Variable: d_Co_understa

Emerge_ Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	101	1.7624	1.1929	0.1187	0	3.0000
1	15	1.6000	1.2984	0.3352	0	3.0000
Diff (1-2)		0.1624	1.2063	0.3338		

Emerge_ Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.7624	1.5269	1.9979	1.1929	1.0480	1.3846
1		1.6000	0.8810	2.3190	1.2984	0.9506	2.0476
Diff (1-2)	Pooled	0.1624	-0.4989	0.8236	1.2063	1.0680	1.3861
Diff (1-2)	Satterthwaite	0.1624	-0.5857	0.9105			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.49	0.6276
Satterthwaite	Unequal	17.691	0.46	0.6535

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Variable: d_Co_understa

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	14	100	1.18	0.5976

Variable: a_Bus_serv_cloud

Emerge_ Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	101	2.3069	0.8803	0.0876	0	3.0000
1	15	2.0667	0.9612	0.2482	0	3.0000
Diff (1-2)		0.2403	0.8906	0.2464		

Emerge_ Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		2.3069	2.1332	2.4807	0.8803	0.7733	1.0217
1		2.0667	1.5344	2.5989	0.9612	0.7037	1.5158
Diff (1-2)	Pooled	0.2403	-0.2479	0.7284	0.8906	0.7885	1.0233
Diff (1-2)	Satterthwaite	0.2403	-0.3134	0.7939			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.97	0.3316
Satterthwaite	Unequal	17.667	0.91	0.3736

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	14	100	1.19	0.5862

Variable: b_Ultra_speed_Inter

Emerge_ Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	101	1.2475	1.0527	0.1047	0	3.0000
1	15	1.4667	0.9155	0.2364	0	3.0000
Diff (1-2)		-0.2191	1.0368	0.2869		

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Variable: b_Ultra_speed_Inter

Emerge_ Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.2475	1.0397	1.4553	1.0527	0.9248	1.2219
1		1.4667	0.9597	1.9736	0.9155	0.6702	1.4438
Diff (1-2)	Pooled	-0.2191	-0.7875	0.3492	1.0368	0.9179	1.1913
Diff (1-2)	Satterthwaite	-0.2191	-0.7586	0.3203			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-0.76	0.4465
Satterthwaite	Unequal	19.93	-0.85	0.4067

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	100	14	1.32	0.5743

Variable: c_New_revenues

Emerge_ Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	101	1.6733	0.9707	0.0966	0	3.0000
1	15	2.2000	0.8619	0.2225	1.0000	3.0000
Diff (1-2)		-0.5267	0.9580	0.2651		

Emerge_ Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.6733	1.4816	1.8649	0.9707	0.8528	1.1267
1		2.2000	1.7227	2.6773	0.8619	0.6310	1.3593
Diff (1-2)	Pooled	-0.5267	-1.0518	-0.00162	0.9580	0.8481	1.1008
Diff (1-2)	Satterthwaite	-0.5267	-1.0333	-0.0201			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-1.99	0.0493
Satterthwaite	Unequal	19.673	-2.17	0.0423

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	100	14	1.27	0.6414

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Variable: d_Smart_home_sol

Emerge_ Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	101	0.7723	0.9683	0.0964	0	3.0000
1	15	0.2667	0.5936	0.1533	0	2.0000
Diff (1-2)		0.5056	0.9305	0.2575		

Emerge_ Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.7723	0.5811	0.9634	0.9683	0.8507	1.1240
1		0.2667	-0.0621	0.5954	0.5936	0.4346	0.9362
Diff (1-2)	Pooled	0.5056	-0.00443	1.0156	0.9305	0.8238	1.0691
Diff (1-2)	Satterthwaite	0.5056	0.1339	0.8773			

```
                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       1.96      0.0520
                 Satterthwaite    Unequal      26.668       2.79      0.0095

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       100        14       2.66    0.0422


                                  Variable:  a_Invest_net

        Emerge_
        Oper             N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              101      1.9010      1.1790      0.1173           0      3.0000
        1               15      1.8000      1.2071      0.3117           0      3.0000
        Diff (1-2)              0.1010      1.1825      0.3272

Emerge_
Oper          Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.9010      1.6682   2.1337      1.1790      1.0358   1.3685
1                               1.8000      1.1315   2.4685      1.2071      0.8838   1.9038
Diff (1-2)    Pooled            0.1010     -0.5472   0.7492      1.1825      1.0469   1.3588
Diff (1-2)    Satterthwaite     0.1010     -0.5981   0.8001

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.31      0.7582
                 Satterthwaite    Unequal      18.197       0.30      0.7651
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                                  Variable:  a_Invest_net

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        14       100       1.05    0.8270


                                Variable:  b_Use_billing_rel

        Emerge_
        Oper             N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              101      1.0990      1.1000      0.1095           0      3.0000
        1               15      0.7333      0.8837      0.2282           0      3.0000
        Diff (1-2)              0.3657      1.0758      0.2977

Emerge_
Oper          Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.0990      0.8818   1.3162      1.1000      0.9664   1.2769
1                               0.7333      0.2439   1.2227      0.8837      0.6470   1.3937
Diff (1-2)    Pooled            0.3657     -0.2240   0.9554      1.0758      0.9525   1.2362
Diff (1-2)    Satterthwaite     0.3657     -0.1606   0.8919

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       1.23      0.2218
                 Satterthwaite    Unequal      21.029       1.44      0.1632

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       100        14       1.55    0.3585


                                Variable:  c_Gen_rev_Wholes

        Emerge_
        Oper             N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              101      1.2475      0.9209      0.0916           0      3.0000
        1               15      1.2667      0.9612      0.2482           0      3.0000
        Diff (1-2)             -0.0191      0.9260      0.2562
```

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                             Variable:  c_Gen_rev_Wholes

  Emerge_
  Oper         Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

  0                              1.2475      1.0657   1.4293      0.9209      0.8091   1.0690
  1                              1.2667      0.7344   1.7989      0.9612      0.7037   1.5158
  Diff (1-2)   Pooled           -0.0191     -0.5267   0.4884      0.9260      0.8198   1.0640
  Diff (1-2)   Satterthwaite    -0.0191     -0.5749   0.5366

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.07      0.9406
                 Satterthwaite    Unequal      18.031      -0.07      0.9431

                                Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        14       100       1.09    0.7531


                            Variable:  d_Converge_net_serv

          Emerge_
          Oper            N       Mean     Std Dev     Std Err     Minimum     Maximum

          0             101     1.7525      1.0715      0.1066           0      3.0000
          1              15     2.2000      0.9411      0.2430           0      3.0000
          Diff (1-2)           -0.4475      1.0564      0.2923

  Emerge_
  Oper         Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

  0                              1.7525      1.5409   1.9640      1.0715      0.9414   1.2437
  1                              2.2000      1.6788   2.7212      0.9411      0.6890   1.4842
  Diff (1-2)   Pooled           -0.4475     -1.0266   0.1315      1.0564      0.9352   1.2138
  Diff (1-2)   Satterthwaite    -0.4475     -1.0014   0.1064

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -1.53      0.1285
                 Satterthwaite    Unequal      19.806      -1.69      0.1074

                                Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       100        14       1.30    0.6057
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                               Variable:  a_Access_Net

          Emerge_
          Oper            N       Mean     Std Dev     Std Err     Minimum     Maximum

          0             101     2.0396      1.1038      0.1098           0      3.0000
          1              15     1.6667      1.0465      0.2702           0      3.0000
          Diff (1-2)            0.3729      1.0969      0.3035

  Emerge_
  Oper         Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

  0                              2.0396      1.8217   2.2575      1.1038      0.9698   1.2812
  1                              1.6667      1.0871   2.2462      1.0465      0.7662   1.6505
  Diff (1-2)   Pooled            0.3729     -0.2284   0.9742      1.0969      0.9712   1.2604
  Diff (1-2)   Satterthwaite     0.3729     -0.2377   0.9836

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       1.23      0.2217
                 Satterthwaite    Unequal      18.936       1.28      0.2165

                                Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F
```

```
                  Folded F       100        14       1.11    0.8754


                                Variable:  b_Core_Net

        Emerge_
        Oper            N        Mean     Std Dev     Std Err     Minimum     Maximum

        0             101      1.3564      1.0157      0.1011           0      3.0000
        1              15      1.5333      1.1872      0.3065           0      3.0000
        Diff (1-2)            -0.1769      1.0383      0.2873

Emerge_
Oper         Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.3564      1.1559   1.5570      1.0157      0.8924   1.1790
1                               1.5333      0.8759   2.1908      1.1872      0.8692   1.8724
Diff (1-2)    Pooled           -0.1769     -0.7461   0.3923      1.0383      0.9193   1.1931
Diff (1-2)    Satterthwaite    -0.1769     -0.8573   0.5036

                Method           Variances        DF    t Value    Pr > |t|

                Pooled           Equal           114      -0.62      0.5393
                Satterthwaite    Unequal      17.181      -0.55      0.5907
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                                Variable:  b_Core_Net

                                Equality of Variances

                  Method      Num DF    Den DF    F Value    Pr > F

                  Folded F        14       100       1.37    0.3679


                              Variable:  c_Service_Apps

        Emerge_
        Oper            N        Mean     Std Dev     Std Err     Minimum     Maximum

        0             101      1.8317      0.9906      0.0986           0      3.0000
        1              15      1.8667      1.1872      0.3065           0      3.0000
        Diff (1-2)            -0.0350      1.0168      0.2814

Emerge_
Oper         Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.8317      1.6361   2.0272      0.9906      0.8703   1.1499
1                               1.8667      1.2092   2.5241      1.1872      0.8692   1.8724
Diff (1-2)    Pooled           -0.0350     -0.5924   0.5224      1.0168      0.9002   1.1684
Diff (1-2)    Satterthwaite    -0.0350     -0.7143   0.6443

                Method           Variances        DF    t Value    Pr > |t|

                Pooled           Equal           114      -0.12      0.9013
                Satterthwaite    Unequal       17.02      -0.11      0.9148

                                Equality of Variances

                  Method      Num DF    Den DF    F Value    Pr > F

                  Folded F        14       100       1.44    0.3011


                               Variable:  d_QoS_monitor

        Emerge_
        Oper            N        Mean     Std Dev     Std Err     Minimum     Maximum

        0             101      0.7723      0.9261      0.0921           0      3.0000
        1              15      0.9333      0.9612      0.2482           0      3.0000
        Diff (1-2)            -0.1611      0.9305      0.2575
```

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                               Variable:  d_QoS_monitor

Emerge_
```

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    Oper          Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

    0                                0.7723      0.5895   0.9551      0.9261      0.8136   1.0749
    1                                0.9333      0.4011   1.4656      0.9612      0.7037   1.5158
    Diff (1-2)    Pooled            -0.1611     -0.6711   0.3490      0.9305      0.8238   1.0691
    Diff (1-2)    Satterthwaite     -0.1611     -0.7170   0.3949

                     Method           Variances        DF    t Value    Pr > |t|

                     Pooled           Equal           114      -0.63      0.5329
                     Satterthwaite    Unequal      18.079      -0.61      0.5505

                                         Equality of Variances

                          Method      Num DF    Den DF    F Value    Pr > F

                          Folded F        14       100       1.08    0.7744


                                    Variable:  a_Strategic_collab

            Emerge_
            Oper             N        Mean     Std Dev     Std Err     Minimum     Maximum

            0              101      1.5545      1.0146      0.1010           0      3.0000
            1               15      1.5333      0.9155      0.2364           0      3.0000
            Diff (1-2)              0.0211      1.0030      0.2775

    Emerge_
    Oper          Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

    0                                1.5545      1.3542   1.7548      1.0146      0.8914   1.1777
    1                                1.5333      1.0264   2.0403      0.9155      0.6702   1.4438
    Diff (1-2)    Pooled             0.0211     -0.5287   0.5709      1.0030      0.8880   1.1525
    Diff (1-2)    Satterthwaite      0.0211     -0.5160   0.5582

                     Method           Variances        DF    t Value    Pr > |t|

                     Pooled           Equal           114       0.08      0.9395
                     Satterthwaite    Unequal      19.483       0.08      0.9353

                                         Equality of Variances

                          Method      Num DF    Den DF    F Value    Pr > F

                          Folded F       100        14       1.23    0.6955
```

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                                     Variable:  b_Effective_regul

            Emerge_
            Oper             N        Mean     Std Dev     Std Err     Minimum     Maximum

            0              101      0.8119      1.0556      0.1050           0      3.0000
            1               15      0.7333      1.0328      0.2667           0      3.0000
            Diff (1-2)              0.0785      1.0528      0.2913

    Emerge_
    Oper          Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

    0                                0.8119      0.6035   1.0203      1.0556      0.9274   1.2253
    1                                0.7333      0.1614   1.3053      1.0328      0.7561   1.6288
    Diff (1-2)    Pooled             0.0785     -0.4986   0.6557      1.0528      0.9321   1.2097
    Diff (1-2)    Satterthwaite      0.0785     -0.5222   0.6793

                     Method           Variances        DF    t Value    Pr > |t|

                     Pooled           Equal           114       0.27      0.7879
                     Satterthwaite    Unequal      18.618       0.27      0.7871

                                         Equality of Variances

                          Method      Num DF    Den DF    F Value    Pr > F

                          Folded F       100        14       1.04    0.9961


                                       Variable:  c_Cont_invest

            Emerge_
            Oper             N        Mean     Std Dev     Std Err     Minimum     Maximum
```

```
        0             101      2.1188      0.9411      0.0936           0      3.0000
        1              15      1.8000      1.0142      0.2619           0      3.0000
        Diff (1-2)             0.3188      0.9504      0.2630

Emerge_
Oper          Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                2.1188      1.9330   2.3046      0.9411      0.8268   1.0924
1                                1.8000      1.2384   2.3616      1.0142      0.7425   1.5995
Diff (1-2)    Pooled             0.3188     -0.2022   0.8398      0.9504      0.8414   1.0921
Diff (1-2)    Satterthwaite      0.3188     -0.2660   0.9036

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       1.21      0.2279
                 Satterthwaite    Unequal      17.769       1.15      0.2668
```

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                                  Variable:  c_Cont_invest

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        14       100       1.16    0.6335


                                 Variable:  d_Bundling_serv

        Emerge_
        Oper             N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              101      1.5149      1.0734      0.1068           0      3.0000
        1               15      1.9333      1.2228      0.3157           0      3.0000
        Diff (1-2)             -0.4185      1.0929      0.3024

Emerge_
Oper          Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.5149      1.3029   1.7268      1.0734      0.9431   1.2460
1                                1.9333      1.2562   2.6105      1.2228      0.8952   1.9285
Diff (1-2)    Pooled            -0.4185     -1.0176   0.1806      1.0929      0.9676   1.2558
Diff (1-2)    Satterthwaite     -0.4185     -1.1206   0.2836

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -1.38      0.1691
                 Satterthwaite    Unequal      17.356      -1.26      0.2259

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        14       100       1.30    0.4447


                                Variable:  a_Sys_vend_integ

        Emerge_
        Oper             N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              101      1.4653      1.1451      0.1139           0      3.0000
        1               15      1.2667      1.0328      0.2667           0      3.0000
        Diff (1-2)             0.1987      1.1319      0.3132
```

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                                Variable:  a_Sys_vend_integ

Emerge_
Oper          Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.4653      1.2393   1.6914      1.1451      1.0060   1.3292
1                                1.2667      0.6947   1.8386      1.0328      0.7561   1.6288
Diff (1-2)    Pooled             0.1987     -0.4218   0.8192      1.1319      1.0021   1.3006
Diff (1-2)    Satterthwaite      0.1987     -0.4072   0.8046

                 Method           Variances        DF    t Value    Pr > |t|
```

```
                  Pooled           Equal           114       0.63      0.5271
                  Satterthwaite    Unequal      19.488       0.69      0.5013

                                    Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F       100        14       1.23    0.6942


                               Variable:  b_Oth_oper_wholesale

         Emerge_
         Oper             N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              101      1.0990      1.0149      0.1010           0      3.0000
         1               15      0.8667      1.0601      0.2737           0      3.0000
         Diff (1-2)              0.2323      1.0206      0.2824

 Emerge_
 Oper          Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                               1.0990      0.8986   1.2994      1.0149      0.8917   1.1781
 1                               0.8667      0.2796   1.4537      1.0601      0.7761   1.6719
 Diff (1-2)    Pooled            0.2323     -0.3271   0.7918      1.0206      0.9036   1.1727
 Diff (1-2)    Satterthwaite     0.2323     -0.3805   0.8452

                  Method           Variances        DF    t Value    Pr > |t|

                  Pooled           Equal           114       0.82      0.4124
                  Satterthwaite    Unequal      18.024       0.80      0.4362

                                    Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F        14       100       1.09    0.7501
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                                   Variable:  c_Cont_provid

         Emerge_
         Oper             N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              101      1.9406      0.9881      0.0983           0      3.0000
         1               15      2.4000      0.6325      0.1633      1.0000      3.0000
         Diff (1-2)             -0.4594      0.9517      0.2633

 Emerge_
 Oper          Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                               1.9406      1.7455   2.1357      0.9881      0.8681   1.1470
 1                               2.4000      2.0498   2.7502      0.6325      0.4630   0.9974
 Diff (1-2)    Pooled           -0.4594     -0.9811   0.0623      0.9517      0.8425   1.0935
 Diff (1-2)    Satterthwaite    -0.4594     -0.8516  -0.0672

                  Method           Variances        DF    t Value    Pr > |t|

                  Pooled           Equal           114      -1.74      0.0838
                  Satterthwaite    Unequal      25.522      -2.41      0.0235

                                    Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F       100        14       2.44    0.0624


                                  Variable:  d_Net_co_Skype

         Emerge_
         Oper             N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              101      1.4950      1.1715      0.1166           0      3.0000
         1               15      1.4667      1.1872      0.3065           0      3.0000
         Diff (1-2)              0.0284      1.1735      0.3247

 Emerge_
 Oper          Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev
```

```
0                              1.4950      1.2638   1.7263      1.1715      1.0292   1.3598
1                              1.4667      0.8092   2.1241      1.1872      0.8692   1.8724
Diff (1-2)    Pooled           0.0284     -0.6149   0.6716      1.1735      1.0389   1.3484
Diff (1-2)    Satterthwaite    0.0284     -0.6599   0.7166

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.09      0.9305
                 Satterthwaite    Unequal      18.288       0.09      0.9320
```

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                                       Variable:  d_Net_co_Skype

                                         Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        14       100       1.03    0.8668


                                         Variable:  a_Int_resist

        Emerge_
        Oper             N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              101      1.6733      1.0593      0.1054           0      3.0000
        1               15      1.8000      0.9411      0.2430           0      3.0000
        Diff (1-2)             -0.1267      1.0455      0.2893

Emerge_
Oper          Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.6733      1.4641   1.8824      1.0593      0.9307   1.2296
1                                1.8000      1.2788   2.3212      0.9411      0.6890   1.4842
Diff (1-2)    Pooled            -0.1267     -0.6998   0.4464      1.0455      0.9256   1.2014
Diff (1-2)    Satterthwaite     -0.1267     -0.6799   0.4264

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.44      0.6622
                 Satterthwaite    Unequal      19.667      -0.48      0.6376

                                         Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       100        14       1.27    0.6431


                                       Variable:  b_Out_date_bus

        Emerge_
        Oper             N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              101      2.2871      0.9092      0.0905           0      3.0000
        1               15      2.4667      0.7432      0.1919      1.0000      3.0000
        Diff (1-2)             -0.1795      0.8905      0.2464
```

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                                       Variable:  b_Out_date_bus

Emerge_
Oper          Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                2.2871      2.1076   2.4666      0.9092      0.7988   1.0554
1                                2.4667      2.0551   2.8783      0.7432      0.5441   1.1721
Diff (1-2)    Pooled            -0.1795     -0.6677   0.3086      0.8905      0.7884   1.0233
Diff (1-2)    Satterthwaite     -0.1795     -0.6210   0.2620

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.73      0.4677
                 Satterthwaite    Unequal      20.772      -0.85      0.4071

                                         Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F
```

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                           Folded F       100        14       1.50    0.4001


                                        Variable:  c_Erod_profit

            Emerge_
            Oper              N        Mean     Std Dev     Std Err     Minimum     Maximum

            0               101      1.3168      0.9892      0.0984           0      3.0000
            1                15      0.7333      0.7988      0.2063           0      3.0000
            Diff (1-2)               0.5835      0.9679      0.2678

    Emerge_
    Oper          Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

    0                                1.3168      1.1215   1.5121      0.9892      0.8691   1.1483
    1                                0.7333      0.2910   1.1757      0.7988      0.5848   1.2598
    Diff (1-2)    Pooled             0.5835      0.0529   1.1141      0.9679      0.8569   1.1121
    Diff (1-2)    Satterthwaite      0.5835      0.1082   1.0588

                      Method           Variances        DF    t Value    Pr > |t|

                      Pooled           Equal           114       2.18      0.0314
                      Satterthwaite    Unequal      20.952       2.55      0.0185

                                         Equality of Variances

                           Method      Num DF    Den DF    F Value    Pr > F

                           Folded F       100        14       1.53    0.3705
```

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                                         Variable:  d_Much_reg

            Emerge_
            Oper              N        Mean     Std Dev     Std Err     Minimum     Maximum

            0               101      0.7228      0.9068      0.0902           0      3.0000
            1                15      1.0000      1.1339      0.2928           0      3.0000
            Diff (1-2)              -0.2772      0.9377      0.2595

    Emerge_
    Oper          Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

    0                                0.7228      0.5437   0.9018      0.9068      0.7967   1.0526
    1                                1.0000      0.3721   1.6279      1.1339      0.8302   1.7883
    Diff (1-2)    Pooled            -0.2772     -0.7912   0.2368      0.9377      0.8302   1.0775
    Diff (1-2)    Satterthwaite     -0.2772     -0.9243   0.3698

                      Method           Variances        DF    t Value    Pr > |t|

                      Pooled           Equal           114      -1.07      0.2876
                      Satterthwaite    Unequal      16.765      -0.90      0.3783

                                         Equality of Variances

                           Method      Num DF    Den DF    F Value    Pr > F

                           Folded F        14       100       1.56    0.2060


                                        Variable:  a_Mod_scalable

            Emerge_
            Oper              N        Mean     Std Dev     Std Err     Minimum     Maximum

            0               101      2.1881      0.8569      0.0853           0      3.0000
            1                15      2.1333      0.8338      0.2153      1.0000      3.0000
            Diff (1-2)               0.0548      0.8541      0.2363

    Emerge_
    Oper          Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

    0                                2.1881      2.0190   2.3573      0.8569      0.7528   0.9946
    1                                2.1333      1.6716   2.5951      0.8338      0.6105   1.3150
    Diff (1-2)    Pooled             0.0548     -0.4134   0.5230      0.8541      0.7562   0.9814
    Diff (1-2)    Satterthwaite      0.0548     -0.4304   0.5400

                      Method           Variances        DF    t Value    Pr > |t|

                      Pooled           Equal           114       0.23      0.8171
```

Satterthwaite	Unequal	18.672	0.24	0.8155

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Variable: a_Mod_scalable

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	100	14	1.06	0.9749

Variable: b_One_stop_shop

Emerge_ Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	101	1.8515	1.0333	0.1028	0	3.0000
1	15	1.6667	1.0465	0.2702	0	3.0000
Diff (1-2)		0.1848	1.0349	0.2864		

Emerge_ Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.8515	1.6475	2.0555	1.0333	0.9078	1.1994
1		1.6667	1.0871	2.2462	1.0465	0.7662	1.6505
Diff (1-2)	Pooled	0.1848	-0.3825	0.7521	1.0349	0.9163	1.1892
Diff (1-2)	Satterthwaite	0.1848	-0.4219	0.7915			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.65	0.5200
Satterthwaite	Unequal	18.294	0.64	0.5306

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	14	100	1.03	0.8691

Variable: c_Lean_org

Emerge_ Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	101	1.5743	0.9094	0.0905	0	3.0000
1	15	1.7333	1.0328	0.2667	0	3.0000
Diff (1-2)		-0.1591	0.9254	0.2561		

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Variable: c_Lean_org

Emerge_ Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.5743	1.3947	1.7538	0.9094	0.7989	1.0555
1		1.7333	1.1614	2.3053	1.0328	0.7561	1.6288
Diff (1-2)	Pooled	-0.1591	-0.6663	0.3482	0.9254	0.8193	1.0633
Diff (1-2)	Satterthwaite	-0.1591	-0.7522	0.4341			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-0.62	0.5357
Satterthwaite	Unequal	17.377	-0.56	0.5794

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	14	100	1.29	0.4540

Variable: d_Max_cont_mono

Emerge_ Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum

0	101	0.3861	0.7479	0.0744	0	3.0000
1	15	0.4667	0.9155	0.2364	0	3.0000
Diff (1-2)		-0.0805	0.7705	0.2132		

Emerge_ Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.3861	0.2385	0.5338	0.7479	0.6571	0.8682
1		0.4667	-0.0403	0.9736	0.9155	0.6702	1.4438
Diff (1-2)	Pooled	-0.0805	-0.5029	0.3418	0.7705	0.6821	0.8853
Diff (1-2)	Satterthwaite	-0.0805	-0.6036	0.4426			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-0.38	0.7063
Satterthwaite	Unequal	16.89	-0.32	0.7492

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	14	100	1.50	0.2509

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                          Variable:  a_Existing_rel

        Europe           N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              100      1.9300      1.0941      0.1094           0      3.0000
        1               16      2.1250      1.1475      0.2869           0      3.0000
        Diff (1-2)             -0.1950      1.1013      0.2965

Europe        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.9300      1.7129   2.1471      1.0941      0.9606   1.2710
1                                2.1250      1.5136   2.7364      1.1475      0.8476   1.7759
Diff (1-2)    Pooled            -0.1950     -0.7824   0.3924      1.1013      0.9750   1.2654
Diff (1-2)    Satterthwaite     -0.1950     -0.8362   0.4462

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.66      0.5121
                 Satterthwaite    Unequal      19.619      -0.64      0.5327

                            Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        15        99       1.10    0.7332


                          Variable:  b_Own_phys_net

        Europe           N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              100      1.3200      1.0625      0.1062           0      3.0000
        1               16      1.5000      1.0328      0.2582           0      3.0000
        Diff (1-2)             -0.1800      1.0586      0.2850

Europe        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.3200      1.1092   1.5308      1.0625      0.9329   1.2343
1                                1.5000      0.9497   2.0503      1.0328      0.7629   1.5984
Diff (1-2)    Pooled            -0.1800     -0.7447   0.3847      1.0586      0.9372   1.2164
Diff (1-2)    Satterthwaite     -0.1800     -0.7616   0.4016

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.63      0.5290
                 Satterthwaite    Unequal      20.421      -0.64      0.5263
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                          Variable:  b_Own_phys_net

                            Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        99        15       1.06    0.9632


                             Variable:  c_Fin_str

        Europe           N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              100      1.4900      1.0200      0.1020           0      3.0000
        1               16      1.8125      0.9811      0.2453           0      3.0000
        Diff (1-2)             -0.3225      1.0149      0.2733

Europe        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.4900      1.2876   1.6924      1.0200      0.8955   1.1849
1                                1.8125      1.2897   2.3353      0.9811      0.7247   1.5184
Diff (1-2)    Pooled            -0.3225     -0.8639   0.2189      1.0149      0.8985   1.1662
Diff (1-2)    Satterthwaite     -0.3225     -0.8757   0.2307

                 Method           Variances        DF    t Value    Pr > |t|
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                Pooled           Equal           114      -1.18      0.2404
                Satterthwaite    Unequal      20.544      -1.21      0.2385

                                   Equality of Variances

                     Method      Num DF    Den DF    F Value    Pr > F

                     Folded F        99        15       1.08    0.9215


                                   Variable:  d_Reput_exp

        Europe           N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              100      1.2600      1.1859      0.1186           0      3.0000
        1               16      0.5625      0.7274      0.1819           0      2.0000
        Diff (1-2)              0.6975      1.1362      0.3059
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                                   Variable:  d_Reput_exp

Europe        Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.2600      1.0247   1.4953      1.1859      1.0413   1.3777
1                               0.5625      0.1749   0.9501      0.7274      0.5374   1.1259
Diff (1-2)    Pooled            0.6975      0.0914   1.3036      1.1362      1.0060   1.3056
Diff (1-2)    Satterthwaite     0.6975      0.2539   1.1411

                Method           Variances        DF    t Value    Pr > |t|

                Pooled           Equal           114       2.28      0.0245
                Satterthwaite    Unequal      29.658       3.21      0.0032

                                   Equality of Variances

                     Method      Num DF    Den DF    F Value    Pr > F

                     Folded F        99        15       2.66    0.0355


                                 Variable:  a_Outdated_net

        Europe           N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              100      1.6800      1.0529      0.1053           0      3.0000
        1               16      1.3750      1.0247      0.2562           0      3.0000
        Diff (1-2)              0.3050      1.0493      0.2825

Europe        Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.6800      1.4711   1.8889      1.0529      0.9245   1.2232
1                               1.3750      0.8290   1.9210      1.0247      0.7569   1.5859
Diff (1-2)    Pooled            0.3050     -0.2547   0.8647      1.0493      0.9290   1.2057
Diff (1-2)    Satterthwaite     0.3050     -0.2720   0.8820

                Method           Variances        DF    t Value    Pr > |t|

                Pooled           Equal           114       1.08      0.2826
                Satterthwaite    Unequal      20.408       1.10      0.2836

                                   Equality of Variances

                     Method      Num DF    Den DF    F Value    Pr > F

                     Folded F        99        15       1.06    0.9679
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                                 Variable:  b_Low_serv_qual

        Europe           N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              100      2.0700      1.0661      0.1066           0      3.0000
        1               16      2.6250      0.7188      0.1797      1.0000      3.0000
        Diff (1-2)             -0.5550      1.0271      0.2766

Europe        Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               2.0700      1.8585   2.2815      1.0661      0.9360   1.2384
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1                             2.6250     2.2420   3.0080     0.7188     0.5310   1.1125
Diff (1-2)    Pooled         -0.5550    -1.1028 -0.00715     1.0271     0.9093   1.1802
Diff (1-2)    Satterthwaite  -0.5550    -0.9838  -0.1262

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -2.01      0.0471
                 Satterthwaite    Unequal      26.911      -2.66      0.0131

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        99        15       2.20    0.0858


                                  Variable:  c_Expen_telec

        Europe           N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              100      0.9800      0.9845      0.0985           0      3.0000
        1               16      1.1875      0.6551      0.1638           0      2.0000
        Diff (1-2)             -0.2075      0.9477      0.2552

Europe        Method                Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                             0.9800      0.7846   1.1754      0.9845      0.8644   1.1437
1                             1.1875      0.8384   1.5366      0.6551      0.4839   1.0139
Diff (1-2)    Pooled         -0.2075     -0.7130   0.2980      0.9477      0.8391   1.0890
Diff (1-2)    Satterthwaite  -0.2075     -0.5994   0.1844

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.81      0.4178
                 Satterthwaite    Unequal       27.26      -1.09      0.2870
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                                  Variable:  c_Expen_telec

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        99        15       2.26    0.0762


                                  Variable:  d_Limit_rigid

        Europe           N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              100      1.2700      1.0717      0.1072           0      3.0000
        1               16      0.8125      1.1673      0.2918           0      3.0000
        Diff (1-2)              0.4575      1.0848      0.2921

Europe        Method                Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                             1.2700      1.0573   1.4827      1.0717      0.9410   1.2450
1                             0.8125      0.1905   1.4345      1.1673      0.8623   1.8066
Diff (1-2)    Pooled          0.4575     -0.1211   1.0361      1.0848      0.9604   1.2465
Diff (1-2)    Satterthwaite   0.4575     -0.1926   1.1076

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       1.57      0.1200
                 Satterthwaite    Unequal      19.266       1.47      0.1573

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        15        99       1.19    0.5900


                               Variable:  a_Oth_telcos_attack

        Europe           N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              100      1.7300      0.9832      0.0983           0      3.0000
        1               16      1.5625      0.7274      0.1819      1.0000      3.0000
        Diff (1-2)              0.1675      0.9535      0.2567
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                                Variable:  a_Oth_telcos_attack

Europe        Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.7300      1.5349   1.9251      0.9832      0.8633   1.1422
1                               1.5625      1.1749   1.9501      0.7274      0.5374   1.1259
Diff (1-2)    Pooled            0.1675     -0.3411   0.6761      0.9535      0.8442   1.0956
Diff (1-2)    Satterthwaite     0.1675     -0.2585   0.5935

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.65      0.5155
                 Satterthwaite    Unequal      24.731       0.81      0.4256

                                    Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        99        15       1.83    0.1861


                                 Variable:  b_Cable_Sat_Wire

        Europe           N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              100      2.0600      0.8625      0.0862           0      3.0000
        1               16      2.0000      0.8165      0.2041           0      3.0000
        Diff (1-2)              0.0600      0.8566      0.2306

Europe        Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               2.0600      1.8889   2.2311      0.8625      0.7572   1.0019
1                               2.0000      1.5649   2.4351      0.8165      0.6031   1.2637
Diff (1-2)    Pooled            0.0600     -0.3969   0.5169      0.8566      0.7583   0.9842
Diff (1-2)    Satterthwaite     0.0600     -0.4012   0.5212

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.26      0.7952
                 Satterthwaite    Unequal      20.734       0.27      0.7893

                                    Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        99        15       1.12    0.8593
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                                 Variable:  c_Equip_vend_sys

        Europe           N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              100      0.5200      0.7314      0.0731           0      3.0000
        1               16      0.3750      0.8062      0.2016           0      3.0000
        Diff (1-2)              0.1450      0.7417      0.1997

Europe        Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               0.5200      0.3749   0.6651      0.7314      0.6422   0.8497
1                               0.3750     -0.0546   0.8046      0.8062      0.5956   1.2478
Diff (1-2)    Pooled            0.1450     -0.2506   0.5406      0.7417      0.6566   0.8522
Diff (1-2)    Satterthwaite     0.1450     -0.3035   0.5935

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.73      0.4693
                 Satterthwaite    Unequal       19.16       0.68      0.5070

                                    Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        15        99       1.22    0.5469


                                   Variable:  d_Co_understa
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Europe	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	100	1.6900	1.1951	0.1195	0	3.0000
1	16	2.0625	1.2366	0.3091	0	3.0000
Diff (1-2)		-0.3725	1.2006	0.3233		

Europe	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.6900	1.4529	1.9271	1.1951	1.0493	1.3883
1		2.0625	1.4036	2.7214	1.2366	0.9135	1.9139
Diff (1-2)	Pooled	-0.3725	-1.0129	0.2679	1.2006	1.0629	1.3796
Diff (1-2)	Satterthwaite	-0.3725	-1.0644	0.3194			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-1.15	0.2516
Satterthwaite	Unequal	19.751	-1.12	0.2745

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The TTEST Procedure

Variable: d_Co_understa

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	15	99	1.07	0.7861

Variable: a_Bus_serv_cloud

Europe	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	100	2.2900	0.8796	0.0880	0	3.0000
1	16	2.1875	0.9811	0.2453	0	3.0000
Diff (1-2)		0.1025	0.8936	0.2406		

Europe	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		2.2900	2.1155	2.4645	0.8796	0.7723	1.0218
1		2.1875	1.6647	2.7103	0.9811	0.7247	1.5184
Diff (1-2)	Pooled	0.1025	-0.3741	0.5791	0.8936	0.7911	1.0268
Diff (1-2)	Satterthwaite	0.1025	-0.4427	0.6477			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.43	0.6709
Satterthwaite	Unequal	19.058	0.39	0.6984

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	15	99	1.24	0.5058

Variable: b_Ultra_speed_Inter

Europe	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	100	1.3800	1.0228	0.1023	0	3.0000
1	16	0.6250	0.8851	0.2213	0	3.0000
Diff (1-2)		0.7550	1.0057	0.2708		

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The TTEST Procedure

Variable: b_Ultra_speed_Inter

Europe	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.3800	1.1771	1.5829	1.0228	0.8980	1.1881
1		0.6250	0.1534	1.0966	0.8851	0.6538	1.3698
Diff (1-2)	Pooled	0.7550	0.2185	1.2915	1.0057	0.8904	1.1556
Diff (1-2)	Satterthwaite	0.7550	0.2494	1.2606			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	2.79	0.0062
Satterthwaite	Unequal	21.943	3.10	0.0053

```
                                        Equality of Variances

                          Method      Num DF    Den DF    F Value    Pr > F

                          Folded F        99        15       1.34    0.5412


                                      Variable:  c_New_revenues

            Europe           N        Mean     Std Dev     Std Err     Minimum     Maximum

            0              100      1.7100      0.9878      0.0988           0      3.0000
            1               16      1.9375      0.8539      0.2135           0      3.0000
            Diff (1-2)             -0.2275      0.9712      0.2615

    Europe       Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

    0                              1.7100      1.5140   1.9060      0.9878      0.8673   1.1474
    1                              1.9375      1.4825   2.3925      0.8539      0.6308   1.3216
    Diff (1-2)   Pooled           -0.2275     -0.7455   0.2905      0.9712      0.8598   1.1160
    Diff (1-2)   Satterthwaite    -0.2275     -0.7154   0.2604

                     Method           Variances        DF    t Value    Pr > |t|

                     Pooled           Equal           114      -0.87      0.3861
                     Satterthwaite    Unequal      21.958      -0.97      0.3440

                                        Equality of Variances

                          Method      Num DF    Den DF    F Value    Pr > F

                          Folded F        99        15       1.34    0.5381
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                                       The TTEST Procedure

                                     Variable:  d_Smart_home_sol

            Europe           N        Mean     Std Dev     Std Err     Minimum     Maximum

            0              100      0.6200      0.8851      0.0885           0      3.0000
            1               16      1.2500      1.1255      0.2814           0      3.0000
            Diff (1-2)             -0.6300      0.9203      0.2478

    Europe       Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

    0                              0.6200      0.4444   0.7956      0.8851      0.7771   1.0282
    1                              1.2500      0.6503   1.8497      1.1255      0.8314   1.7419
    Diff (1-2)   Pooled           -0.6300     -1.1209  -0.1391      0.9203      0.8148   1.0575
    Diff (1-2)   Satterthwaite    -0.6300     -1.2495  -0.0105

                     Method           Variances        DF    t Value    Pr > |t|

                     Pooled           Equal           114      -2.54      0.0124
                     Satterthwaite    Unequal      18.089      -2.14      0.0466

                                        Equality of Variances

                          Method      Num DF    Den DF    F Value    Pr > F

                          Folded F        15        99       1.62    0.1653


                                       Variable:  a_Invest_net

            Europe           N        Mean     Std Dev     Std Err     Minimum     Maximum

            0              100      1.8700      1.1777      0.1178           0      3.0000
            1               16      2.0000      1.2111      0.3028           0      3.0000
            Diff (1-2)             -0.1300      1.1821      0.3183

    Europe       Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

    0                              1.8700      1.6363   2.1037      1.1777      1.0340   1.3681
    1                              2.0000      1.3547   2.6453      1.2111      0.8946   1.8743
    Diff (1-2)   Pooled           -0.1300     -0.7606   0.5006      1.1821      1.0466   1.3583
    Diff (1-2)   Satterthwaite    -0.1300     -0.8081   0.5481

                     Method           Variances        DF    t Value    Pr > |t|

                     Pooled           Equal           114      -0.41      0.6837
                     Satterthwaite    Unequal      19.814      -0.40      0.6933
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The TTEST Procedure

Variable: a_Invest_net

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	15	99	1.06	0.8109

Variable: b_Use_billing_rel

Europe	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	100	1.0800	1.0888	0.1089	0	3.0000
1	16	0.8750	1.0247	0.2562	0	3.0000
Diff (1-2)		0.2050	1.0806	0.2910		

Europe	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.0800	0.8640	1.2960	1.0888	0.9560	1.2648
1		0.8750	0.3290	1.4210	1.0247	0.7569	1.5859
Diff (1-2)	Pooled	0.2050	-0.3714	0.7814	1.0806	0.9567	1.2416
Diff (1-2)	Satterthwaite	0.2050	-0.3742	0.7842			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.70	0.4825
Satterthwaite	Unequal	20.806	0.74	0.4697

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	99	15	1.13	0.8365

Variable: c_Gen_rev_Wholes

Europe	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	100	1.2700	0.9195	0.0920	0	3.0000
1	16	1.1250	0.9574	0.2394	0	3.0000
Diff (1-2)		0.1450	0.9246	0.2490		

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Variable: c_Gen_rev_Wholes

Europe	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.2700	1.0875	1.4525	0.9195	0.8074	1.0682
1		1.1250	0.6148	1.6352	0.9574	0.7073	1.4818
Diff (1-2)	Pooled	0.1450	-0.3482	0.6382	0.9246	0.8186	1.0624
Diff (1-2)	Satterthwaite	0.1450	-0.3904	0.6804			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.58	0.5614
Satterthwaite	Unequal	19.689	0.57	0.5781

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	15	99	1.08	0.7616

Variable: d_Converge_net_serv

Europe	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	100	1.7800	1.0879	0.1088	0	3.0000
1	16	2.0000	0.8944	0.2236	0	3.0000
Diff (1-2)		-0.2200	1.0644	0.2866		

Europe	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.7800	1.5641	1.9959	1.0879	0.9551	1.2637

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    1                           2.0000     1.5234   2.4766     0.8944     0.6607   1.3843
    Diff (1-2)    Pooled       -0.2200    -0.7878   0.3478     1.0644     0.9424   1.2231
    Diff (1-2)    Satterthwaite -0.2200   -0.7347   0.2947

                     Method           Variances        DF    t Value    Pr > |t|

                     Pooled           Equal           114      -0.77      0.4443
                     Satterthwaite    Unequal      22.748      -0.88      0.3856

                                        Equality of Variances

                          Method      Num DF    Den DF    F Value    Pr > F

                          Folded F        99        15       1.48    0.3957
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                                       Variable:  a_Access_Net

            Europe           N        Mean     Std Dev     Std Err     Minimum     Maximum

            0              100      1.9800      1.1099      0.1110           0      3.0000
            1               16      2.0625      1.0626      0.2657           0      3.0000
            Diff (1-2)             -0.0825      1.1038      0.2972

    Europe        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

    0                                1.9800      1.7598   2.2002      1.1099      0.9745   1.2894
    1                                2.0625      1.4963   2.6287      1.0626      0.7850   1.6446
    Diff (1-2)    Pooled            -0.0825     -0.6713   0.5063      1.1038      0.9772   1.2683
    Diff (1-2)    Satterthwaite     -0.0825     -0.6820   0.5170

                     Method           Variances        DF    t Value    Pr > |t|

                     Pooled           Equal           114      -0.28      0.7818
                     Satterthwaite    Unequal      20.599      -0.29      0.7773

                                        Equality of Variances

                          Method      Num DF    Den DF    F Value    Pr > F

                          Folded F        99        15       1.09    0.9031


                                        Variable:  b_Core_Net

            Europe           N        Mean     Std Dev     Std Err     Minimum     Maximum

            0              100      1.4900      1.0298      0.1030           0      3.0000
            1               16      0.6875      0.7932      0.1983           0      2.0000
            Diff (1-2)              0.8025      1.0019      0.2698

    Europe        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

    0                                1.4900      1.2857   1.6943      1.0298      0.9042   1.1963
    1                                0.6875      0.2648   1.1102      0.7932      0.5859   1.2276
    Diff (1-2)    Pooled             0.8025      0.2681   1.3369      1.0019      0.8870   1.1512
    Diff (1-2)    Satterthwaite      0.8025      0.3412   1.2638

                     Method           Variances        DF    t Value    Pr > |t|

                     Pooled           Equal           114       2.97      0.0036
                     Satterthwaite    Unequal      23.918       3.59      0.0015
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                                        Variable:  b_Core_Net

                                        Equality of Variances

                          Method      Num DF    Den DF    F Value    Pr > F

                          Folded F        99        15       1.69    0.2523


                                      Variable:  c_Service_Apps

            Europe           N        Mean     Std Dev     Std Err     Minimum     Maximum

            0              100      1.7400      1.0212      0.1021           0      3.0000
```

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        1              16      2.4375      0.7274      0.1819      1.0000      3.0000
        Diff (1-2)            -0.6975      0.9875      0.2659

Europe        Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.7400      1.5374   1.9426      1.0212      0.8966   1.1863
1                               2.4375      2.0499   2.8251      0.7274      0.5374   1.1259
Diff (1-2)    Pooled           -0.6975     -1.2243  -0.1707      0.9875      0.8743   1.1347
Diff (1-2)    Satterthwaite    -0.6975     -1.1266  -0.2684

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -2.62      0.0099
                 Satterthwaite    Unequal      25.566      -3.34      0.0026

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        99        15       1.97    0.1373


                                  Variable:  d_QoS_monitor

        Europe           N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              100      0.7900      0.9566      0.0957           0      3.0000
        1               16      0.8125      0.7500      0.1875           0      2.0000
        Diff (1-2)            -0.0225      0.9320      0.2510
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                                  Variable:  d_QoS_monitor

Europe        Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               0.7900      0.6002   0.9798      0.9566      0.8399   1.1112
1                               0.8125      0.4129   1.2121      0.7500      0.5540   1.1608
Diff (1-2)    Pooled           -0.0225     -0.5196   0.4746      0.9320      0.8252   1.0709
Diff (1-2)    Satterthwaite    -0.0225     -0.4573   0.4123

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.09      0.9287
                 Satterthwaite    Unequal      23.583      -0.11      0.9158

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        99        15       1.63    0.2867


                               Variable:  a_Strategic_collab

        Europe           N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              100      1.5700      1.0176      0.1018           0      3.0000
        1               16      1.4375      0.8921      0.2230           0      3.0000
        Diff (1-2)             0.1325      1.0020      0.2698

Europe        Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.5700      1.3681   1.7719      1.0176      0.8934   1.1821
1                               1.4375      0.9621   1.9129      0.8921      0.6590   1.3807
Diff (1-2)    Pooled            0.1325     -0.4019   0.6669      1.0020      0.8871   1.1513
Diff (1-2)    Satterthwaite     0.1325     -0.3762   0.6412

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.49      0.6243
                 Satterthwaite    Unequal      21.752       0.54      0.5943

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        99        15       1.30    0.5827
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                              Variable:  b_Effective_regul

        Europe          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0             100      0.8400      1.0514      0.1051           0      3.0000
        1              16      0.5625      1.0308      0.2577           0      3.0000
        Diff (1-2)             0.2775      1.0487      0.2824

Europe       Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               0.8400      0.6314   1.0486      1.0514      0.9231   1.2214
1                               0.5625      0.0132   1.1118      1.0308      0.7614   1.5953
Diff (1-2)   Pooled             0.2775     -0.2819   0.8369      1.0487      0.9285   1.2050
Diff (1-2)   Satterthwaite      0.2775     -0.3025   0.8575

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.98      0.3278
                 Satterthwaite    Unequal      20.324       1.00      0.3305

                                Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        99        15       1.04    0.9973


                               Variable:  c_Cont_invest

        Europe          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0             100      2.0400      0.9526      0.0953           0      3.0000
        1              16      2.3125      0.9465      0.2366           0      3.0000
        Diff (1-2)            -0.2725      0.9518      0.2563

Europe       Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               2.0400      1.8510   2.2290      0.9526      0.8364   1.1066
1                               2.3125      1.8082   2.8168      0.9465      0.6992   1.4649
Diff (1-2)   Pooled            -0.2725     -0.7802   0.2352      0.9518      0.8427   1.0937
Diff (1-2)   Satterthwaite     -0.2725     -0.8043   0.2593

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -1.06      0.2899
                 Satterthwaite    Unequal      20.176      -1.07      0.2980
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                               Variable:  c_Cont_invest

                                Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        99        15       1.01    1.0000


                              Variable:  d_Bundling_serv

        Europe          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0             100      1.5500      1.1225      0.1123           0      3.0000
        1              16      1.6875      0.9465      0.2366           0      3.0000
        Diff (1-2)            -0.1375      1.1010      0.2964

Europe       Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.5500      1.3273   1.7727      1.1225      0.9856   1.3040
1                               1.6875      1.1832   2.1918      0.9465      0.6992   1.4649
Diff (1-2)   Pooled            -0.1375     -0.7248   0.4498      1.1010      0.9747   1.2651
Diff (1-2)   Satterthwaite     -0.1375     -0.6802   0.4052

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.46      0.6437
                 Satterthwaite    Unequal       22.34      -0.53      0.6047

                                Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F
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Method	Num DF	Den DF	F Value	Pr > F
Folded F	99	15	1.41	0.4637

Variable: a_Sys_vend_integ

Europe	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	100	1.4900	1.1590	0.1159	0	3.0000
1	16	1.1250	0.8851	0.2213	0	3.0000
Diff (1-2)		0.3650	1.1268	0.3034		

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The TTEST Procedure

Variable: a_Sys_vend_integ

Europe	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.4900	1.2600	1.7200	1.1590	1.0176	1.3464
1		1.1250	0.6534	1.5966	0.8851	0.6538	1.3698
Diff (1-2)	Pooled	0.3650	-0.2360	0.9660	1.1268	0.9976	1.2947
Diff (1-2)	Satterthwaite	0.3650	-0.1504	0.8804			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	1.20	0.2315
Satterthwaite	Unequal	24.086	1.46	0.1569

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	99	15	1.71	0.2368

Variable: b_Oth_oper_wholesale

Europe	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	100	1.1000	1.0200	0.1020	0	3.0000
1	16	0.8750	1.0247	0.2562	0	3.0000
Diff (1-2)		0.2250	1.0206	0.2748		

Europe	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.1000	0.8976	1.3024	1.0200	0.8956	1.1849
1		0.8750	0.3290	1.4210	1.0247	0.7569	1.5859
Diff (1-2)	Pooled	0.2250	-0.3194	0.7694	1.0206	0.9036	1.1727
Diff (1-2)	Satterthwaite	0.2250	-0.3501	0.8001			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.82	0.4146
Satterthwaite	Unequal	20.057	0.82	0.4241

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	15	99	1.01	0.9045

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The TTEST Procedure

Variable: c_Cont_provid

Europe	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	100	1.9200	0.9814	0.0981	0	3.0000
1	16	2.5000	0.6325	0.1581	1.0000	3.0000
Diff (1-2)		-0.5800	0.9429	0.2539		

Europe	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.9200	1.7253	2.1147	0.9814	0.8617	1.1401
1		2.5000	2.1630	2.8370	0.6325	0.4672	0.9788
Diff (1-2)	Pooled	-0.5800	-1.0830	-0.0770	0.9429	0.8348	1.0835
Diff (1-2)	Satterthwaite	-0.5800	-0.9611	-0.1989			

Method	Variances	DF	t Value	Pr > |t|

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                  Pooled           Equal          114      -2.28      0.0242
                  Satterthwaite    Unequal      28.152      -3.12      0.0042

                               Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F        99        15       2.41    0.0568


                             Variable:  d_Net_co_Skype

          Europe           N        Mean     Std Dev     Std Err     Minimum     Maximum

          0              100      1.4900      1.1677      0.1168           0      3.0000
          1               16      1.5000      1.2111      0.3028           0      3.0000
          Diff (1-2)             -0.0100      1.1735      0.3160

  Europe        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

  0                                1.4900      1.2583   1.7217      1.1677      1.0253   1.3565
  1                                1.5000      0.8547   2.1453      1.2111      0.8946   1.8743
  Diff (1-2)    Pooled            -0.0100     -0.6359   0.6159      1.1735      1.0389   1.3484
  Diff (1-2)    Satterthwaite     -0.0100     -0.6875   0.6675

                  Method           Variances        DF    t Value    Pr > |t|

                  Pooled           Equal           114      -0.03      0.9748
                  Satterthwaite    Unequal      19.728      -0.03      0.9757
```

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                             Variable:  d_Net_co_Skype

                               Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F        15        99       1.08    0.7771


                              Variable:  a_Int_resist

          Europe           N        Mean     Std Dev     Std Err     Minimum     Maximum

          0              100      1.6900      1.0702      0.1070           0      3.0000
          1               16      1.6875      0.8732      0.2183           0      3.0000
          Diff (1-2)             0.00250      1.0464      0.2818

  Europe        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

  0                                1.6900      1.4776   1.9024      1.0702      0.9397   1.2432
  1                                1.6875      1.2222   2.1528      0.8732      0.6450   1.3515
  Diff (1-2)    Pooled            0.00250     -0.5557   0.5607      1.0464      0.9264   1.2024
  Diff (1-2)    Satterthwaite     0.00250     -0.5006   0.5056

                  Method           Variances        DF    t Value    Pr > |t|

                  Pooled           Equal           114       0.01      0.9929
                  Satterthwaite    Unequal      22.876       0.01      0.9919

                               Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F        99        15       1.50    0.3764


                             Variable:  b_Out_date_bus

          Europe           N        Mean     Std Dev     Std Err     Minimum     Maximum

          0              100      2.2500      0.9143      0.0914           0      3.0000
          1               16      2.6875      0.6021      0.1505      1.0000      3.0000
          Diff (1-2)             -0.4375      0.8795      0.2368
```

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                             Variable:  b_Out_date_bus
```

```
Europe        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                2.2500      2.0686   2.4314      0.9143      0.8027   1.0621
1                                2.6875      2.3667   3.0083      0.6021      0.4448   0.9318
Diff (1-2)    Pooled            -0.4375     -0.9066   0.0316      0.8795      0.7787   1.0106
Diff (1-2)    Satterthwaite     -0.4375     -0.7985  -0.0765

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -1.85      0.0673
                 Satterthwaite    Unequal      27.542      -2.48      0.0193

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        99        15       2.31    0.0694


                                  Variable:  c_Erod_profit

        Europe           N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              100      1.3000      1.0000      0.1000           0      3.0000
        1               16      0.8750      0.8062      0.2016           0      3.0000
        Diff (1-2)              0.4250      0.9767      0.2630

Europe        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.3000      1.1016   1.4984      1.0000      0.8780   1.1617
1                                0.8750      0.4454   1.3046      0.8062      0.5956   1.2478
Diff (1-2)    Pooled             0.4250     -0.0960   0.9460      0.9767      0.8647   1.1223
Diff (1-2)    Satterthwaite      0.4250     -0.0404   0.8904

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       1.62      0.1088
                 Satterthwaite    Unequal      23.082       1.89      0.0715

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        99        15       1.54    0.3476
```

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                                   Variable:  d_Much_reg

        Europe           N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              100      0.7600      0.9333      0.0933           0      3.0000
        1               16      0.7500      1.0000      0.2500           0      3.0000
        Diff (1-2)              0.0100      0.9424      0.2537

Europe        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                0.7600      0.5748   0.9452      0.9333      0.8195   1.0842
1                                0.7500      0.2171   1.2829      1.0000      0.7387   1.5477
Diff (1-2)    Pooled             0.0100     -0.4927   0.5127      0.9424      0.8343   1.0828
Diff (1-2)    Satterthwaite      0.0100     -0.5477   0.5677

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.04      0.9686
                 Satterthwaite    Unequal      19.416       0.04      0.9705

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        15        99       1.15    0.6510


                                  Variable:  a_Mod_scalable

        Europe           N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              100      2.2100      0.8444      0.0844           0      3.0000
        1               16      2.0000      0.8944      0.2236      1.0000      3.0000
        Diff (1-2)              0.2100      0.8512      0.2292
```

```
    Europe        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

    0                                2.2100      2.0425   2.3775      0.8444      0.7414   0.9809
    1                                2.0000      1.5234   2.4766      0.8944      0.6607   1.3843
    Diff (1-2)    Pooled             0.2100     -0.2440   0.6640      0.8512      0.7536   0.9780
    Diff (1-2)    Satterthwaite      0.2100     -0.2894   0.7094

                     Method           Variances        DF    t Value    Pr > |t|

                     Pooled           Equal           114       0.92      0.3614
                     Satterthwaite    Unequal      19.523       0.88      0.3903
```

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                                  Variable:  a_Mod_scalable

                                    Equality of Variances

                          Method      Num DF    Den DF    F Value    Pr > F

                          Folded F        15        99       1.12    0.6946


                                  Variable:  b_One_stop_shop

            Europe           N        Mean     Std Dev     Std Err     Minimum     Maximum

            0              100      1.7900      1.0473      0.1047           0      3.0000
            1               16      2.0625      0.9287      0.2322           0      3.0000
            Diff (1-2)             -0.2725      1.0325      0.2780

    Europe        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

    0                                1.7900      1.5822   1.9978      1.0473      0.9195   1.2166
    1                                2.0625      1.5676   2.5574      0.9287      0.6860   1.4374
    Diff (1-2)    Pooled            -0.2725     -0.8232   0.2782      1.0325      0.9141   1.1864
    Diff (1-2)    Satterthwaite     -0.2725     -0.8013   0.2563

                     Method           Variances        DF    t Value    Pr > |t|

                     Pooled           Equal           114      -0.98      0.3291
                     Satterthwaite    Unequal       21.59      -1.07      0.2965

                                    Equality of Variances

                          Method      Num DF    Den DF    F Value    Pr > F

                          Folded F        99        15       1.27    0.6206


                                    Variable:  c_Lean_org

            Europe           N        Mean     Std Dev     Std Err     Minimum     Maximum

            0              100      1.5800      0.9231      0.0923           0      3.0000
            1               16      1.6875      0.9465      0.2366           0      3.0000
            Diff (1-2)             -0.1075      0.9262      0.2494
```

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                                    Variable:  c_Lean_org

    Europe        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

    0                                1.5800      1.3968   1.7632      0.9231      0.8105   1.0723
    1                                1.6875      1.1832   2.1918      0.9465      0.6992   1.4649
    Diff (1-2)    Pooled            -0.1075     -0.6015   0.3865      0.9262      0.8200   1.0643
    Diff (1-2)    Satterthwaite     -0.1075     -0.6376   0.4226

                     Method           Variances        DF    t Value    Pr > |t|

                     Pooled           Equal           114      -0.43      0.6672
                     Satterthwaite    Unequal      19.844      -0.42      0.6767

                                    Equality of Variances

                          Method      Num DF    Den DF    F Value    Pr > F

                          Folded F        15        99       1.05    0.8226
```

Variable: d_Max_cont_mono

Europe	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	100	0.4200	0.7808	0.0781	0	3.0000
1	16	0.2500	0.6831	0.1708	0	2.0000
Diff (1-2)		0.1700	0.7687	0.2070		

Europe	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.4200	0.2651	0.5749	0.7808	0.6856	0.9071
1		0.2500	-0.1140	0.6140	0.6831	0.5046	1.0573
Diff (1-2)	Pooled	0.1700	-0.2400	0.5800	0.7687	0.6805	0.8833
Diff (1-2)	Satterthwaite	0.1700	-0.2197	0.5597			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.82	0.4132
Satterthwaite	Unequal	21.782	0.91	0.3752

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	99	15	1.31	0.5760

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                             Variable:  a_Existing_rel

        Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              102      2.0000      1.0991      0.1088           0      3.0000
        1               14      1.6429      1.0818      0.2891           0      3.0000
        Diff (1-2)              0.3571      1.0971      0.3127

Exe_Emerge    Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                2.0000      1.7841   2.2159      1.0991      0.9661   1.2747
1                                1.6429      1.0182   2.2675      1.0818      0.7843   1.7429
Diff (1-2)    Pooled             0.3571     -0.2623   0.9766      1.0971      0.9713   1.2606
Diff (1-2)    Satterthwaite      0.3571     -0.2949   1.0092

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       1.14      0.2558
                 Satterthwaite    Unequal        16.9       1.16      0.2637

                               Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       101        13       1.03    1.0000


                             Variable:  b_Own_phys_net

        Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              102      1.3529      1.0591      0.1049           0      3.0000
        1               14      1.2857      1.0690      0.2857           0      3.0000
        Diff (1-2)              0.0672      1.0603      0.3022

Exe_Emerge    Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.3529      1.1449   1.5610      1.0591      0.9310   1.2284
1                                1.2857      0.6685   1.9030      1.0690      0.7750   1.7223
Diff (1-2)    Pooled             0.0672     -0.5314   0.6659      1.0603      0.9387   1.2183
Diff (1-2)    Satterthwaite      0.0672     -0.5758   0.7102

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.22      0.8243
                 Satterthwaite    Unequal        16.7       0.22      0.8279
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                             Variable:  b_Own_phys_net

                               Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        13       101       1.02    0.8789


                                Variable:  c_Fin_str

        Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              102      1.5196      1.0218      0.1012           0      3.0000
        1               14      1.6429      1.0082      0.2695           0      3.0000
        Diff (1-2)             -0.1232      1.0203      0.2908

Exe_Emerge    Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.5196      1.3189   1.7203      1.0218      0.8983   1.1852
1                                1.6429      1.0607   2.2250      1.0082      0.7309   1.6243
Diff (1-2)    Pooled            -0.1232     -0.6993   0.4528      1.0203      0.9033   1.1724
Diff (1-2)    Satterthwaite     -0.1232     -0.7308   0.4843

                 Method           Variances        DF    t Value    Pr > |t|
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                      Pooled           Equal           114      -0.42      0.6725
                      Satterthwaite    Unequal      16.881      -0.43      0.6739

                                         Equality of Variances

                           Method      Num DF    Den DF    F Value    Pr > F

                           Folded F       101        13       1.03    1.0000


                                         Variable:  d_Reput_exp

             Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

             0              102      1.1275      1.1229      0.1112           0      3.0000
             1               14      1.4286      1.3986      0.3738           0      3.0000
             Diff (1-2)             -0.3011      1.1576      0.3299
```

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                                         Variable:  d_Reput_exp

     Exe_Emerge    Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

     0                               1.1275      0.9069   1.3480      1.1229      0.9871   1.3023
     1                               1.4286      0.6211   2.2361      1.3986      1.0139   2.2532
     Diff (1-2)    Pooled           -0.3011     -0.9547   0.3525      1.1576      1.0249   1.3302
     Diff (1-2)    Satterthwaite    -0.3011     -1.1305   0.5283

                      Method           Variances        DF    t Value    Pr > |t|

                      Pooled           Equal           114      -0.91      0.3634
                      Satterthwaite    Unequal      15.387      -0.77      0.4517

                                         Equality of Variances

                           Method      Num DF    Den DF    F Value    Pr > F

                           Folded F        13       101       1.55    0.2246


                                       Variable:  a_Outdated_net

             Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

             0              102      1.6471      1.0684      0.1058           0      3.0000
             1               14      1.5714      0.9376      0.2506           0      3.0000
             Diff (1-2)              0.0756      1.0543      0.3005

     Exe_Emerge    Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

     0                               1.6471      1.4372   1.8569      1.0684      0.9392   1.2392
     1                               1.5714      1.0301   2.1128      0.9376      0.6797   1.5105
     Diff (1-2)    Pooled            0.0756     -0.5197   0.6709      1.0543      0.9334   1.2115
     Diff (1-2)    Satterthwaite     0.0756     -0.4959   0.6471

                      Method           Variances        DF    t Value    Pr > |t|

                      Pooled           Equal           114       0.25      0.8017
                      Satterthwaite    Unequal      17.973       0.28      0.7841

                                         Equality of Variances

                           Method      Num DF    Den DF    F Value    Pr > F

                           Folded F       101        13       1.30    0.6212
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                                       Variable:  b_Low_serv_qual

             Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

             0              102      2.0980      1.0671      0.1057           0      3.0000
             1               14      2.5000      0.7596      0.2030      1.0000      3.0000
             Diff (1-2)             -0.4020      1.0367      0.2955

     Exe_Emerge    Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

     0                               2.0980      1.8884   2.3076      1.0671      0.9381   1.2377
```

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1                             2.5000     2.0614   2.9386      0.7596      0.5506   1.2237
Diff (1-2)    Pooled         -0.4020    -0.9873   0.1834      1.0367      0.9178   1.1912
Diff (1-2)    Satterthwaite  -0.4020    -0.8782   0.0742

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -1.36      0.1764
                 Satterthwaite    Unequal      20.802      -1.76      0.0937

                                  Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       101        13       1.97    0.1681


                                 Variable:  c_Expen_telec

        Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              102      1.0392      0.9432      0.0934           0      3.0000
        1               14      0.7857      0.9750      0.2606           0      3.0000
        Diff (1-2)              0.2535      0.9468      0.2699

Exe_Emerge    Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.0392      0.8540   1.2245      0.9432      0.8291   1.0939
1                               0.7857      0.2228   1.3486      0.9750      0.7068   1.5707
Diff (1-2)    Pooled            0.2535     -0.2811   0.7881      0.9468      0.8383   1.0880
Diff (1-2)    Satterthwaite     0.2535     -0.3318   0.8388

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.94      0.3495
                 Satterthwaite    Unequal      16.519       0.92      0.3729
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                                 Variable:  c_Expen_telec

                                  Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        13       101       1.07    0.7894


                                 Variable:  d_Limit_rigid

        Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              102      1.2157      1.0957      0.1085           0      3.0000
        1               14      1.1429      1.0995      0.2938           0      3.0000
        Diff (1-2)              0.0728      1.0961      0.3124

Exe_Emerge    Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.2157      1.0005   1.4309      1.0957      0.9632   1.2708
1                               1.1429      0.5081   1.7777      1.0995      0.7971   1.7713
Diff (1-2)    Pooled            0.0728     -0.5461   0.6917      1.0961      0.9704   1.2595
Diff (1-2)    Satterthwaite     0.0728     -0.5888   0.7344

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.23      0.8161
                 Satterthwaite    Unequal      16.746       0.23      0.8190

                                  Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        13       101       1.01    0.9013


                              Variable:  a_Oth_telcos_attack

        Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              102      1.6373      0.9626      0.0953           0      3.0000
        1               14      2.2143      0.6993      0.1869      1.0000      3.0000
        Diff (1-2)             -0.5770      0.9363      0.2669
```

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The TTEST Procedure

Variable: a_Oth_telcos_attack

Exe_Emerge	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.6373	1.4482	1.8263	0.9626	0.8462	1.1164
1		2.2143	1.8105	2.6180	0.6993	0.5070	1.1266
Diff (1-2)	Pooled	-0.5770	-1.1057	-0.0484	0.9363	0.8289	1.0758
Diff (1-2)	Satterthwaite	-0.5770	-1.0140	-0.1400			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-2.16	0.0327
Satterthwaite	Unequal	20.462	-2.75	0.0122

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	101	13	1.89	0.1950

Variable: b_Cable_Sat_Wire

Exe_Emerge	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	102	2.1569	0.7803	0.0773	0	3.0000
1	14	1.2857	0.9945	0.2658	0	3.0000
Diff (1-2)		0.8711	0.8076	0.2302		

Exe_Emerge	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		2.1569	2.0036	2.3101	0.7803	0.6859	0.9050
1		1.2857	0.7115	1.8599	0.9945	0.7210	1.6022
Diff (1-2)	Pooled	0.8711	0.4152	1.3271	0.8076	0.7150	0.9279
Diff (1-2)	Satterthwaite	0.8711	0.2821	1.4602			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	3.78	0.0002
Satterthwaite	Unequal	15.276	3.15	0.0065

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	13	101	1.62	0.1810

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Variable: c_Equip_vend_sys

Exe_Emerge	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	102	0.5000	0.7413	0.0734	0	3.0000
1	14	0.5000	0.7596	0.2030	0	2.0000
Diff (1-2)		0	0.7434	0.2119		

Exe_Emerge	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.5000	0.3544	0.6456	0.7413	0.6516	0.8598
1		0.5000	0.0614	0.9386	0.7596	0.5506	1.2237
Diff (1-2)	Pooled	0	-0.4197	0.4197	0.7434	0.6582	0.8542
Diff (1-2)	Satterthwaite	0	-0.4563	0.4563			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.00	1.0000
Satterthwaite	Unequal	16.585	0.00	1.0000

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	13	101	1.05	0.8224

Variable: d_Co_understa

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         Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              102      1.7059      1.2071      0.1195           0      3.0000
         1               14      2.0000      1.1767      0.3145           0      3.0000
         Diff (1-2)             -0.2941      1.2037      0.3431

 Exe_Emerge    Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                               1.7059      1.4688   1.9430      1.2071      1.0612   1.4001
 1                               2.0000      1.3206   2.6794      1.1767      0.8531   1.8957
 Diff (1-2)    Pooled           -0.2941     -0.9737   0.3855      1.2037      1.0657   1.3831
 Diff (1-2)    Satterthwaite    -0.2941     -1.0040   0.4158

                  Method           Variances        DF    t Value    Pr > |t|

                  Pooled           Equal           114      -0.86      0.3931
                  Satterthwaite    Unequal      16.981      -0.87      0.3942
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                                       Variable:  d_Co_understa

                                        Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F       101        13       1.05    0.9895


                                      Variable:  a_Bus_serv_cloud

         Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              102      2.2843      0.8942      0.0885           0      3.0000
         1               14      2.2143      0.8926      0.2386      1.0000      3.0000
         Diff (1-2)              0.0700      0.8940      0.2548

 Exe_Emerge    Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                               2.2843      2.1087   2.4599      0.8942      0.7860   1.0371
 1                               2.2143      1.6989   2.7296      0.8926      0.6471   1.4380
 Diff (1-2)    Pooled            0.0700     -0.4347   0.5748      0.8940      0.7915   1.0272
 Diff (1-2)    Satterthwaite     0.0700     -0.4673   0.6074

                  Method           Variances        DF    t Value    Pr > |t|

                  Pooled           Equal           114       0.27      0.7839
                  Satterthwaite    Unequal      16.787       0.28      0.7865

                                        Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F       101        13       1.00    1.0000


                                     Variable:  b_Ultra_speed_Inter

         Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              102      1.3137      1.0243      0.1014           0      3.0000
         1               14      1.0000      1.1094      0.2965           0      3.0000
         Diff (1-2)              0.3137      1.0343      0.2948
```

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                                     Variable:  b_Ultra_speed_Inter

 Exe_Emerge    Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                               1.3137      1.1125   1.5149      1.0243      0.9004   1.1880
 1                               1.0000      0.3595   1.6405      1.1094      0.8043   1.7873
 Diff (1-2)    Pooled            0.3137     -0.2703   0.8977      1.0343      0.9157   1.1885
 Diff (1-2)    Satterthwaite     0.3137     -0.3499   0.9774

                  Method           Variances        DF    t Value    Pr > |t|

                  Pooled           Equal           114       1.06      0.2895
                  Satterthwaite    Unequal      16.191       1.00      0.3315
```

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                           Equality of Variances

                  Method      Num DF    Den DF    F Value    Pr > F

                  Folded F        13       101       1.17    0.6198


                         Variable:  c_New_revenues

        Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              102      1.6863      0.9848      0.0975           0      3.0000
        1               14      2.1429      0.7703      0.2059      1.0000      3.0000
        Diff (1-2)             -0.4566      0.9628      0.2744

Exe_Emerge    Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.6863      1.4928   1.8797      0.9848      0.8657   1.1422
1                                2.1429      1.6981   2.5876      0.7703      0.5585   1.2410
Diff (1-2)    Pooled            -0.4566     -1.0002   0.0870      0.9628      0.8524   1.1063
Diff (1-2)    Satterthwaite     -0.4566     -0.9328   0.0196

             Method           Variances        DF    t Value    Pr > |t|

             Pooled           Equal           114      -1.66      0.0989
             Satterthwaite    Unequal      19.362      -2.00      0.0592

                           Equality of Variances

                  Method      Num DF    Den DF    F Value    Pr > F

                  Folded F       101        13       1.63    0.3214
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                         Variable:  d_Smart_home_sol

        Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              102      0.7157      0.9583      0.0949           0      3.0000
        1               14      0.6429      0.8419      0.2250           0      2.0000
        Diff (1-2)              0.0728      0.9458      0.2696

Exe_Emerge    Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                0.7157      0.5275   0.9039      0.9583      0.8424   1.1115
1                                0.6429      0.1568   1.1290      0.8419      0.6103   1.3563
Diff (1-2)    Pooled             0.0728     -0.4612   0.6068      0.9458      0.8373   1.0867
Diff (1-2)    Satterthwaite      0.0728     -0.4403   0.5859

             Method           Variances        DF    t Value    Pr > |t|

             Pooled           Equal           114       0.27      0.7875
             Satterthwaite    Unequal      17.962       0.30      0.7689

                           Equality of Variances

                  Method      Num DF    Den DF    F Value    Pr > F

                  Folded F       101        13       1.30    0.6246


                          Variable:  a_Invest_net

        Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              102      1.8529      1.2056      0.1194           0      3.0000
        1               14      2.1429      0.9493      0.2537           0      3.0000
        Diff (1-2)             -0.2899      1.1792      0.3361

Exe_Emerge    Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.8529      1.6161   2.0897      1.2056      1.0598   1.3982
1                                2.1429      1.5948   2.6909      0.9493      0.6882   1.5293
Diff (1-2)    Pooled            -0.2899     -0.9557   0.3758      1.1792      1.0440   1.3549
Diff (1-2)    Satterthwaite     -0.2899     -0.8762   0.2964

             Method           Variances        DF    t Value    Pr > |t|

             Pooled           Equal           114      -0.86      0.3901
             Satterthwaite    Unequal      19.271      -1.03      0.3139
```

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                               Variable:  a_Invest_net

                                Equality of Variances

                  Method      Num DF    Den DF    F Value    Pr > F

                  Folded F       101        13       1.61    0.3352


                              Variable:  b_Use_billing_rel

         Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              102      1.0196      1.0622      0.1052           0      3.0000
         1               14      1.2857      1.2044      0.3219           0      3.0000
         Diff (1-2)             -0.2661      1.0794      0.3076

 Exe_Emerge    Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                               1.0196      0.8110   1.2282      1.0622      0.9338   1.2320
 1                               1.2857      0.5903   1.9811      1.2044      0.8731   1.9403
 Diff (1-2)    Pooled           -0.2661     -0.8755   0.3433      1.0794      0.9556   1.2403
 Diff (1-2)    Satterthwaite    -0.2661     -0.9843   0.4521

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.86      0.3889
                 Satterthwaite    Unequal      15.901      -0.79      0.4435

                                Equality of Variances

                  Method      Num DF    Den DF    F Value    Pr > F

                  Folded F        13       101       1.29    0.4679


                              Variable:  c_Gen_rev_Wholes

         Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              102      1.3039      0.9312      0.0922           0      3.0000
         1               14      0.8571      0.7703      0.2059           0      2.0000
         Diff (1-2)              0.4468      0.9143      0.2606
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                              Variable:  c_Gen_rev_Wholes

 Exe_Emerge    Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                               1.3039      1.1210   1.4868      0.9312      0.8186   1.0800
 1                               0.8571      0.4124   1.3019      0.7703      0.5585   1.2410
 Diff (1-2)    Pooled            0.4468     -0.0694   0.9630      0.9143      0.8094   1.0506
 Diff (1-2)    Satterthwaite     0.4468     -0.0260   0.9195

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       1.71      0.0891
                 Satterthwaite    Unequal      18.641       1.98      0.0626

                                Equality of Variances

                  Method      Num DF    Den DF    F Value    Pr > F

                  Folded F       101        13       1.46    0.4514


                             Variable:  d_Converge_net_serv

         Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              102      1.8235      1.0475      0.1037           0      3.0000
         1               14      1.7143      1.2044      0.3219           0      3.0000
         Diff (1-2)              0.1092      1.0666      0.3040

 Exe_Emerge    Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                               1.8235      1.6178   2.0293      1.0475      0.9208   1.2149
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1                                1.7143      1.0189   2.4097      1.2044      0.8731   1.9403
Diff (1-2)    Pooled             0.1092     -0.4929   0.7114      1.0666      0.9443   1.2255
Diff (1-2)    Satterthwaite      0.1092     -0.6083   0.8268

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.36      0.7200
                 Satterthwaite    Unequal      15.818       0.32      0.7509

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        13       101       1.32    0.4255
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                                   Variable:  a_Access_Net

        Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              102      2.0098      1.1035      0.1093           0      3.0000
        1               14      1.8571      1.0995      0.2938           0      3.0000
        Diff (1-2)              0.1527      1.1030      0.3144

Exe_Emerge    Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                2.0098      1.7931   2.2266      1.1035      0.9701   1.2799
1                                1.8571      1.2223   2.4919      1.0995      0.7971   1.7713
Diff (1-2)    Pooled             0.1527     -0.4701   0.7754      1.1030      0.9766   1.2675
Diff (1-2)    Satterthwaite      0.1527     -0.5094   0.8147

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.49      0.6282
                 Satterthwaite    Unequal      16.802       0.49      0.6326

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       101        13       1.01    1.0000


                                   Variable:  b_Core_Net

        Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              102      1.4216      1.0382      0.1028           0      3.0000
        1               14      1.0714      0.9972      0.2665           0      3.0000
        Diff (1-2)              0.3501      1.0336      0.2946

Exe_Emerge    Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.4216      1.2176   1.6255      1.0382      0.9127   1.2042
1                                1.0714      0.4956   1.6472      0.9972      0.7230   1.6066
Diff (1-2)    Pooled             0.3501     -0.2335   0.9337      1.0336      0.9151   1.1877
Diff (1-2)    Satterthwaite      0.3501     -0.2523   0.9526

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       1.19      0.2371
                 Satterthwaite    Unequal      17.107       1.23      0.2369
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                                   Variable:  b_Core_Net

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       101        13       1.08    0.9345


                                  Variable:  c_Service_Apps

        Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              102      1.7745      1.0040      0.0994           0      3.0000
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        1              14      2.2857      0.9945      0.2658           0      3.0000
        Diff (1-2)            -0.5112      1.0029      0.2859

Exe_Emerge    Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.7745      1.5773   1.9717      1.0040      0.8826   1.1645
1                               2.2857      1.7115   2.8599      0.9945      0.7210   1.6022
Diff (1-2)    Pooled           -0.5112     -1.0775   0.0551      1.0029      0.8879   1.1524
Diff (1-2)    Satterthwaite    -0.5112     -1.1103   0.0879

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -1.79      0.0764
                 Satterthwaite    Unequal      16.849      -1.80      0.0896

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       101        13       1.02    1.0000


                                  Variable:  d_QoS_monitor

        Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              102      0.7941      0.9475      0.0938           0      3.0000
        1               14      0.7857      0.8018      0.2143           0      2.0000
        Diff (1-2)            0.00840      0.9320      0.2656
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                                  Variable:  d_QoS_monitor

Exe_Emerge    Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               0.7941      0.6080   0.9802      0.9475      0.8329   1.0989
1                               0.7857      0.3228   1.2487      0.8018      0.5813   1.2917
Diff (1-2)    Pooled           0.00840     -0.5178   0.5346      0.9320      0.8252   1.0710
Diff (1-2)    Satterthwaite    0.00840     -0.4823   0.4991

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.03      0.9748
                 Satterthwaite    Unequal      18.375       0.04      0.9717

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       101        13       1.40    0.5126


                               Variable:  a_Strategic_collab

        Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              102      1.5196      1.0121      0.1002           0      3.0000
        1               14      1.7857      0.8926      0.2386           0      3.0000
        Diff (1-2)            -0.2661      0.9992      0.2848

Exe_Emerge    Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.5196      1.3208   1.7184      1.0121      0.8897   1.1739
1                               1.7857      1.2704   2.3011      0.8926      0.6471   1.4380
Diff (1-2)    Pooled           -0.2661     -0.8303   0.2981      0.9992      0.8846   1.1481
Diff (1-2)    Satterthwaite    -0.2661     -0.8099   0.2777

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.93      0.3521
                 Satterthwaite    Unequal      17.921      -1.03      0.3174

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       101        13       1.29    0.6368
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Variable: b_Effective_regul

Exe_Emerge	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	102	0.7745	1.0138	0.1004	0	3.0000
1	14	1.0000	1.3009	0.3477	0	3.0000
Diff (1-2)		-0.2255	1.0505	0.2994		

Exe_Emerge	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.7745	0.5754	0.9736	1.0138	0.8912	1.1759
1		1.0000	0.2489	1.7511	1.3009	0.9431	2.0958
Diff (1-2)	Pooled	-0.2255	-0.8186	0.3677	1.0505	0.9301	1.2071
Diff (1-2)	Satterthwaite	-0.2255	-0.9957	0.5448			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-0.75	0.4529
Satterthwaite	Unequal	15.244	-0.62	0.5424

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	13	101	1.65	0.1695

Variable: c_Cont_invest

Exe_Emerge	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	102	2.0686	0.9571	0.0948	0	3.0000
1	14	2.1429	0.9493	0.2537	1.0000	3.0000
Diff (1-2)		-0.0742	0.9562	0.2725		

Exe_Emerge	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		2.0686	1.8806	2.2566	0.9571	0.8414	1.1101
1		2.1429	1.5948	2.6909	0.9493	0.6882	1.5293
Diff (1-2)	Pooled	-0.0742	-0.6141	0.4657	0.9562	0.8466	1.0987
Diff (1-2)	Satterthwaite	-0.0742	-0.6460	0.4976			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-0.27	0.7858
Satterthwaite	Unequal	16.839	-0.27	0.7873

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Variable: c_Cont_invest

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	101	13	1.02	1.0000

Variable: d_Bundling_serv

Exe_Emerge	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	102	1.6373	1.0972	0.1086	0	3.0000
1	14	1.0714	0.9972	0.2665	0	3.0000
Diff (1-2)		0.5658	1.0862	0.3096		

Exe_Emerge	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.6373	1.4218	1.8528	1.0972	0.9645	1.2725
1		1.0714	0.4956	1.6472	0.9972	0.7230	1.6066
Diff (1-2)	Pooled	0.5658	-0.0475	1.1791	1.0862	0.9617	1.2481
Diff (1-2)	Satterthwaite	0.5658	-0.0398	1.1715			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	1.83	0.0702
Satterthwaite	Unequal	17.616	1.97	0.0653

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F

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                      Folded F       101        13       1.21    0.7367


                                 Variable:  a_Sys_vend_integ

          Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

          0              102      1.4314      1.1126      0.1102           0      3.0000
          1               14      1.5000      1.2860      0.3437           0      3.0000
          Diff (1-2)             -0.0686      1.1337      0.3231
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                                 Variable:  a_Sys_vend_integ

  Exe_Emerge    Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

  0                                1.4314      1.2128   1.6499      1.1126      0.9780   1.2904
  1                                1.5000      0.7575   2.2425      1.2860      0.9323   2.0718
  Diff (1-2)    Pooled            -0.0686     -0.7087   0.5715      1.1337      1.0037   1.3027
  Diff (1-2)    Satterthwaite     -0.0686     -0.8346   0.6973

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.21      0.8322
                 Satterthwaite    Unequal      15.787      -0.19      0.8516

                                    Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        13       101       1.34    0.4098


                               Variable:  b_Oth_oper_wholesale

          Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

          0              102      1.0980      1.0484      0.1038           0      3.0000
          1               14      0.8571      0.7703      0.2059           0      2.0000
          Diff (1-2)              0.2409      1.0206      0.2909

  Exe_Emerge    Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

  0                                1.0980      0.8921   1.3040      1.0484      0.9216   1.2160
  1                                0.8571      0.4124   1.3019      0.7703      0.5585   1.2410
  Diff (1-2)    Pooled             0.2409     -0.3353   0.8171      1.0206      0.9035   1.1727
  Diff (1-2)    Satterthwaite      0.2409     -0.2396   0.7214

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.83      0.4093
                 Satterthwaite    Unequal      20.282       1.04      0.3084

                                    Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       101        13       1.85    0.2113
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                                   Variable:  c_Cont_provid

          Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

          0              102      1.9706      0.9694      0.0960           0      3.0000
          1               14      2.2143      0.8926      0.2386           0      3.0000
          Diff (1-2)             -0.2437      0.9609      0.2739

  Exe_Emerge    Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

  0                                1.9706      1.7802   2.1610      0.9694      0.8522   1.1243
  1                                2.2143      1.6989   2.7296      0.8926      0.6471   1.4380
  Diff (1-2)    Pooled            -0.2437     -0.7863   0.2989      0.9609      0.8508   1.1042
  Diff (1-2)    Satterthwaite     -0.2437     -0.7851   0.2977

                 Method           Variances        DF    t Value    Pr > |t|
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                  Pooled           Equal           114      -0.89      0.3755
                  Satterthwaite    Unequal      17.491      -0.95      0.3562

                                   Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F       101        13       1.18    0.7815


                                 Variable:  d_Net_co_Skype

         Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              102      1.5000      1.1752      0.1164           0      3.0000
         1               14      1.4286      1.1579      0.3095           0      3.0000
         Diff (1-2)              0.0714      1.1733      0.3344

     Exe_Emerge    Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

     0                                1.5000      1.2692   1.7308      1.1752      1.0331   1.3631
     1                                1.4286      0.7600   2.0971      1.1579      0.8394   1.8654
     Diff (1-2)    Pooled             0.0714     -0.5910   0.7339      1.1733      1.0387   1.3482
     Diff (1-2)    Satterthwaite      0.0714     -0.6264   0.7693

                  Method           Variances        DF    t Value    Pr > |t|

                  Pooled           Equal           114       0.21      0.8312
                  Satterthwaite    Unequal      16.893       0.22      0.8315
```

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                                 Variable:  d_Net_co_Skype

                                   Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F       101        13       1.03    1.0000


                                  Variable:  a_Int_resist

         Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              102      1.6961      1.0511      0.1041           0      3.0000
         1               14      1.6429      1.0082      0.2695           0      3.0000
         Diff (1-2)              0.0532      1.0463      0.2982

     Exe_Emerge    Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

     0                                1.6961      1.4896   1.9025      1.0511      0.9240   1.2190
     1                                1.6429      1.0607   2.2250      1.0082      0.7309   1.6243
     Diff (1-2)    Pooled             0.0532     -0.5375   0.6440      1.0463      0.9263   1.2022
     Diff (1-2)    Satterthwaite      0.0532     -0.5559   0.6623

                  Method           Variances        DF    t Value    Pr > |t|

                  Pooled           Equal           114       0.18      0.8587
                  Satterthwaite    Unequal      17.119       0.18      0.8560

                                   Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F       101        13       1.09    0.9295


                                 Variable:  b_Out_date_bus

         Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              102      2.2843      0.8830      0.0874           0      3.0000
         1               14      2.5000      0.9405      0.2514           0      3.0000
         Diff (1-2)             -0.2157      0.8898      0.2536
```

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                                 Variable:  b_Out_date_bus
```

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Exe_Emerge    Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                2.2843      2.1109   2.4578      0.8830      0.7762   1.0242
1                                2.5000      1.9569   3.0431      0.9405      0.6818   1.5152
Diff (1-2)    Pooled            -0.2157     -0.7181   0.2867      0.8898      0.7878   1.0224
Diff (1-2)    Satterthwaite     -0.2157     -0.7790   0.3477

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.85      0.3968
                 Satterthwaite    Unequal      16.305      -0.81      0.4294

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        13       101       1.13    0.6794


                                  Variable:  c_Erod_profit

        Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              102      1.2745      0.9866      0.0977           0      3.0000
        1               14      1.0000      0.9608      0.2568           0      3.0000
        Diff (1-2)              0.2745      0.9837      0.2804

Exe_Emerge    Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.2745      1.0807   1.4683      0.9866      0.8673   1.1443
1                                1.0000      0.4453   1.5547      0.9608      0.6965   1.5478
Diff (1-2)    Pooled             0.2745     -0.2809   0.8299      0.9837      0.8709   1.1303
Diff (1-2)    Satterthwaite      0.2745     -0.3051   0.8542

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.98      0.3296
                 Satterthwaite    Unequal       16.99       1.00      0.3317

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       101        13       1.05    0.9857
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                                   Variable:  d_Much_reg

        Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              102      0.7451      0.9511      0.0942           0      3.0000
        1               14      0.8571      0.8644      0.2310           0      2.0000
        Diff (1-2)             -0.1120      0.9417      0.2684

Exe_Emerge    Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                0.7451      0.5583   0.9319      0.9511      0.8361   1.1032
1                                0.8571      0.3580   1.3563      0.8644      0.6267   1.3926
Diff (1-2)    Pooled            -0.1120     -0.6437   0.4196      0.9417      0.8337   1.0820
Diff (1-2)    Satterthwaite     -0.1120     -0.6370   0.4129

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.42      0.6771
                 Satterthwaite    Unequal      17.617      -0.45      0.6588

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       101        13       1.21    0.7363


                                  Variable:  a_Mod_scalable

        Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              102      2.1667      0.8569      0.0848           0      3.0000
        1               14      2.2857      0.8254      0.2206      1.0000      3.0000
        Diff (1-2)             -0.1190      0.8534      0.2432
```

```
Exe_Emerge    Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               2.1667      1.9984   2.3350      0.8569      0.7533   0.9939
1                               2.2857      1.8091   2.7623      0.8254      0.5984   1.3298
Diff (1-2)    Pooled           -0.1190     -0.6009   0.3628      0.8534      0.7555   0.9806
Diff (1-2)    Satterthwaite    -0.1190     -0.6175   0.3794

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.49      0.6255
                 Satterthwaite    Unequal      17.083      -0.50      0.6209
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                                      Variable:  a_Mod_scalable

                                        Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       101        13       1.08    0.9449


                                      Variable:  b_One_stop_shop

        Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              102      1.8333      1.0349      0.1025           0      3.0000
        1               14      1.7857      1.0509      0.2809           0      3.0000
        Diff (1-2)              0.0476      1.0367      0.2955

Exe_Emerge    Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.8333      1.6301   2.0366      1.0349      0.9097   1.2003
1                               1.7857      1.1789   2.3925      1.0509      0.7619   1.6930
Diff (1-2)    Pooled            0.0476     -0.5377   0.6330      1.0367      0.9178   1.1912
Diff (1-2)    Satterthwaite     0.0476     -0.5842   0.6794

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.16      0.8723
                 Satterthwaite    Unequal      16.653       0.16      0.8754

                                        Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        13       101       1.03    0.8561


                                        Variable:  c_Lean_org

        Exe_Emerge       N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              102      1.5980      0.9148      0.0906           0      3.0000
        1               14      1.5714      1.0163      0.2716           0      3.0000
        Diff (1-2)              0.0266      0.9269      0.2642
```

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                                        Variable:  c_Lean_org

Exe_Emerge    Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.5980      1.4184   1.7777      0.9148      0.8042   1.0610
1                               1.5714      0.9846   2.1583      1.0163      0.7368   1.6374
Diff (1-2)    Pooled            0.0266     -0.4967   0.5500      0.9269      0.8206   1.0651
Diff (1-2)    Satterthwaite     0.0266     -0.5803   0.6335

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.10      0.9199
                 Satterthwaite    Unequal      16.026       0.09      0.9271

                                        Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        13       101       1.23    0.5332
```

Variable: d_Max_cont_mono

Exe_Emerge	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	102	0.4020	0.7868	0.0779	0	3.0000
1	14	0.3571	0.6333	0.1693	0	2.0000
Diff (1-2)		0.0448	0.7708	0.2197		

Exe_Emerge	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.4020	0.2474	0.5565	0.7868	0.6916	0.9125
1		0.3571	-0.00853	0.7228	0.6333	0.4591	1.0203
Diff (1-2)	Pooled	0.0448	-0.3904	0.4800	0.7708	0.6824	0.8857
Diff (1-2)	Satterthwaite	0.0448	-0.3452	0.4348			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.20	0.8387
Satterthwaite	Unequal	18.981	0.24	0.8125

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	101	13	1.54	0.3842

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                                        Variable:  a_Existing_rel

        Exe_NA          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              99      1.9394      1.1141      0.1120           0      3.0000
        1              17      2.0588      1.0290      0.2496           0      3.0000
        Diff (1-2)            -0.1194      1.1025      0.2895

Exe_NA        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.9394      1.7172   2.1616      1.1141      0.9776   1.2953
1                                2.0588      1.5298   2.5879      1.0290      0.7664   1.5661
Diff (1-2)    Pooled            -0.1194     -0.6928   0.4540      1.1025      0.9761   1.2669
Diff (1-2)    Satterthwaite     -0.1194     -0.6854   0.4465

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.41      0.6807
                 Satterthwaite    Unequal      22.938      -0.44      0.6665

                                          Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        98        16       1.17    0.7532


                                        Variable:  b_Own_phys_net

        Exe_NA          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              99      1.2626      1.0060      0.1011           0      3.0000
        1              17      1.8235      1.2367      0.2999           0      3.0000
        Diff (1-2)            -0.5609      1.0414      0.2734

Exe_NA        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.2626      1.0620   1.4633      1.0060      0.8827   1.1696
1                                1.8235      1.1877   2.4594      1.2367      0.9211   1.8822
Diff (1-2)    Pooled            -0.5609     -1.1025  -0.0193      1.0414      0.9220   1.1967
Diff (1-2)    Satterthwaite     -0.5609     -1.2216   0.0998

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -2.05      0.0425
                 Satterthwaite    Unequal      19.801      -1.77      0.0918
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                                        Variable:  b_Own_phys_net

                                          Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        16        98       1.51    0.2218


                                           Variable:  c_Fin_str

        Exe_NA          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              99      1.5960      1.0194      0.1025           0      3.0000
        1              17      1.1765      0.9510      0.2307           0      2.0000
        Diff (1-2)             0.4195      1.0101      0.2652

Exe_NA        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.5960      1.3926   1.7993      1.0194      0.8945   1.1852
1                                1.1765      0.6875   1.6654      0.9510      0.7083   1.4474
Diff (1-2)    Pooled             0.4195     -0.1058   0.9448      1.0101      0.8943   1.1606
Diff (1-2)    Satterthwaite      0.4195     -0.1029   0.9418

                 Method           Variances        DF    t Value    Pr > |t|
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                  Pooled           Equal           114       1.58      0.1164
                  Satterthwaite    Unequal      22.792       1.66      0.1102

                                     Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F        98        16       1.15    0.7917


                                     Variable:  d_Reput_exp

         Exe_NA          N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              99      1.2020      1.1865      0.1192           0      3.0000
         1              17      0.9412      0.9663      0.2344           0      3.0000
         Diff (1-2)             0.2608      1.1581      0.3040
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                                     Variable:  d_Reput_exp

 Exe_NA       Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                               1.2020      0.9654   1.4387      1.1865      1.0411   1.3794
 1                               0.9412      0.4443   1.4380      0.9663      0.7197   1.4707
 Diff (1-2)   Pooled             0.2608     -0.3415   0.8632      1.1581      1.0253   1.3307
 Diff (1-2)   Satterthwaite      0.2608     -0.2807   0.8023

                  Method           Variances        DF    t Value    Pr > |t|

                  Pooled           Equal           114       0.86      0.3927
                  Satterthwaite    Unequal      25.081       0.99      0.3307

                                     Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F        98        16       1.51    0.3543


                                   Variable:  a_Outdated_net

         Exe_NA          N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              99      1.6263      1.0555      0.1061           0      3.0000
         1              17      1.7059      1.0467      0.2539           0      3.0000
         Diff (1-2)            -0.0796      1.0542      0.2768

 Exe_NA       Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                               1.6263      1.4158   1.8368      1.0555      0.9261   1.2271
 1                               1.7059      1.1677   2.2440      1.0467      0.7796   1.5930
 Diff (1-2)   Pooled            -0.0796     -0.6279   0.4687      1.0542      0.9334   1.2114
 Diff (1-2)   Satterthwaite     -0.0796     -0.6503   0.4910

                  Method           Variances        DF    t Value    Pr > |t|

                  Pooled           Equal           114      -0.29      0.7741
                  Satterthwaite    Unequal      21.966      -0.29      0.7750

                                     Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F        98        16       1.02    1.0000
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                                   Variable:  b_Low_serv_qual

         Exe_NA          N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              99      2.2020      1.0200      0.1025           0      3.0000
         1              17      1.8235      1.1311      0.2743           0      3.0000
         Diff (1-2)             0.3785      1.0363      0.2721

 Exe_NA       Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                               2.2020      1.9986   2.4055      1.0200      0.8950   1.1859
```

Exe_NA	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
1		1.8235	1.2420	2.4051	1.1311	0.8424	1.7215
Diff (1-2)	Pooled	0.3785	-0.1605	0.9175	1.0363	0.9175	1.1908
Diff (1-2)	Satterthwaite	0.3785	-0.2311	0.9880			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	1.39	0.1669
Satterthwaite	Unequal	20.714	1.29	0.2105

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	16	98	1.23	0.5195

Variable: c_Expen_telec

Exe_NA	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	99	1.0202	0.9145	0.0919	0	3.0000
1	17	0.9412	1.1440	0.2775	0	3.0000
Diff (1-2)		0.0790	0.9501	0.2494		

Exe_NA	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.0202	0.8378	1.2026	0.9145	0.8024	1.0632
1		0.9412	0.3530	1.5294	1.1440	0.8520	1.7411
Diff (1-2)	Pooled	0.0790	-0.4151	0.5731	0.9501	0.8411	1.0917
Diff (1-2)	Satterthwaite	0.0790	-0.5314	0.6894			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.32	0.7520
Satterthwaite	Unequal	19.665	0.27	0.7897

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Variable: c_Expen_telec

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	16	98	1.56	0.1862

Variable: d_Limit_rigid

Exe_NA	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	99	1.1515	1.0914	0.1097	0	3.0000
1	17	1.5294	1.0676	0.2589	0	3.0000
Diff (1-2)		-0.3779	1.0881	0.2857		

Exe_NA	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.1515	0.9338	1.3692	1.0914	0.9576	1.2689
1		1.5294	0.9805	2.0783	1.0676	0.7951	1.6248
Diff (1-2)	Pooled	-0.3779	-0.9438	0.1880	1.0881	0.9633	1.2502
Diff (1-2)	Satterthwaite	-0.3779	-0.9609	0.2051			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-1.32	0.1885
Satterthwaite	Unequal	22.142	-1.34	0.1926

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	98	16	1.05	0.9821

Variable: a_Oth_telcos_attack

Exe_NA	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	99	1.7980	0.9256	0.0930	0	3.0000
1	17	1.1765	0.9510	0.2307	0	3.0000
Diff (1-2)		0.6215	0.9292	0.2439		

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                         Variable:  a_Oth_telcos_attack

 Exe_NA        Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                               1.7980      1.6134   1.9826      0.9256      0.8122   1.0761
 1                               1.1765      0.6875   1.6654      0.9510      0.7083   1.4474
 Diff (1-2)    Pooled            0.6215      0.1382   1.1048      0.9292      0.8227   1.0677
 Diff (1-2)    Satterthwaite     0.6215      0.1051   1.1379

                  Method           Variances        DF    t Value    Pr > |t|

                  Pooled           Equal           114       2.55      0.0122
                  Satterthwaite    Unequal      21.536       2.50      0.0206

                             Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F        16        98       1.06    0.8151


                          Variable:  b_Cable_Sat_Wire

         Exe_NA          N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              99      2.0101      0.8511      0.0855           0      3.0000
         1              17      2.2941      0.8489      0.2059      1.0000      3.0000
         Diff (1-2)            -0.2840      0.8508      0.2234

 Exe_NA        Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                               2.0101      1.8404   2.1799      0.8511      0.7468   0.9895
 1                               2.2941      1.8577   2.7306      0.8489      0.6322   1.2919
 Diff (1-2)    Pooled           -0.2840     -0.7265   0.1585      0.8508      0.7532   0.9776
 Diff (1-2)    Satterthwaite    -0.2840     -0.7465   0.1785

                  Method           Variances        DF    t Value    Pr > |t|

                  Pooled           Equal           114      -1.27      0.2061
                  Satterthwaite    Unequal      21.894      -1.27      0.2160

                             Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F        98        16       1.01    1.0000
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                          Variable:  c_Equip_vend_sys

         Exe_NA          N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              99      0.5051      0.7336      0.0737           0      3.0000
         1              17      0.4706      0.7998      0.1940           0      2.0000
         Diff (1-2)             0.0345      0.7433      0.1951

 Exe_NA        Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                               0.5051      0.3587   0.6514      0.7336      0.6437   0.8530
 1                               0.4706      0.0594   0.8818      0.7998      0.5957   1.2173
 Diff (1-2)    Pooled            0.0345     -0.3521   0.4210      0.7433      0.6581   0.8541
 Diff (1-2)    Satterthwaite     0.0345     -0.3973   0.4662

                  Method           Variances        DF    t Value    Pr > |t|

                  Pooled           Equal           114       0.18      0.8601
                  Satterthwaite    Unequal      20.886       0.17      0.8697

                             Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F        16        98       1.19    0.5815


                            Variable:  d_Co_understa
```

Exe_NA	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	99	1.6869	1.2425	0.1249	0	3.0000
1	17	2.0588	0.8993	0.2181	0	3.0000
Diff (1-2)		-0.3720	1.2003	0.3151		

Exe_NA	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.6869	1.4391	1.9347	1.2425	1.0902	1.4446
1		2.0588	1.5964	2.5212	0.8993	0.6698	1.3687
Diff (1-2)	Pooled	-0.3720	-0.9962	0.2523	1.2003	1.0626	1.3792
Diff (1-2)	Satterthwaite	-0.3720	-0.8870	0.1431			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-1.18	0.2403
Satterthwaite	Unequal	27.721	-1.48	0.1502

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Variable: d_Co_understa

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	98	16	1.91	0.1425

Variable: a_Bus_serv_cloud

Exe_NA	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	99	2.2323	0.9239	0.0929	0	3.0000
1	17	2.5294	0.6243	0.1514	1.0000	3.0000
Diff (1-2)		-0.2971	0.8880	0.2331		

Exe_NA	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		2.2323	2.0480	2.4166	0.9239	0.8107	1.0742
1		2.5294	2.2084	2.8504	0.6243	0.4649	0.9501
Diff (1-2)	Pooled	-0.2971	-0.7589	0.1647	0.8880	0.7862	1.0203
Diff (1-2)	Satterthwaite	-0.2971	-0.6600	0.0658			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-1.27	0.2051
Satterthwaite	Unequal	29.616	-1.67	0.1049

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	98	16	2.19	0.0771

Variable: b_Ultra_speed_Inter

Exe_NA	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	99	1.2828	1.0404	0.1046	0	3.0000
1	17	1.2353	1.0326	0.2504	0	3.0000
Diff (1-2)		0.0475	1.0393	0.2729		

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Variable: b_Ultra_speed_Inter

Exe_NA	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.2828	1.0753	1.4903	1.0404	0.9129	1.2096
1		1.2353	0.7044	1.7662	1.0326	0.7690	1.5715
Diff (1-2)	Pooled	0.0475	-0.4930	0.5881	1.0393	0.9201	1.1942
Diff (1-2)	Satterthwaite	0.0475	-0.5154	0.6104			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.17	0.8620
Satterthwaite	Unequal	21.956	0.18	0.8626

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                                    Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        98        16       1.02    1.0000


                                  Variable:  c_New_revenues

        Exe_NA          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              99      1.7778      0.9642      0.0969           0      3.0000
        1              17      1.5294      1.0073      0.2443           0      3.0000
        Diff (1-2)             0.2484      0.9704      0.2548

Exe_NA       Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.7778      1.5855   1.9701      0.9642      0.8461   1.1210
1                               1.5294      1.0115   2.0473      1.0073      0.7502   1.5331
Diff (1-2)    Pooled            0.2484     -0.2563   0.7530      0.9704      0.8591   1.1150
Diff (1-2)    Satterthwaite     0.2484     -0.2977   0.7944

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.97      0.3317
                 Satterthwaite    Unequal      21.344       0.94      0.3553

                                    Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        16        98       1.09    0.7473
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                                 Variable:  d_Smart_home_sol

        Exe_NA          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              99      0.7071      0.9395      0.0944           0      3.0000
        1              17      0.7059      0.9852      0.2389           0      3.0000
        Diff (1-2)            0.00119      0.9461      0.2484

Exe_NA       Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               0.7071      0.5197   0.8945      0.9395      0.8244   1.0923
1                               0.7059      0.1993   1.2124      0.9852      0.7337   1.4994
Diff (1-2)    Pooled           0.00119     -0.4908   0.4932      0.9461      0.8376   1.0871
Diff (1-2)    Satterthwaite    0.00119     -0.5327   0.5350

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.00      0.9962
                 Satterthwaite    Unequal      21.303       0.00      0.9964

                                    Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        16        98       1.10    0.7324


                                   Variable:  a_Invest_net

        Exe_NA          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              99      1.8889      1.1943      0.1200           0      3.0000
        1              17      1.8824      1.1114      0.2696           0      3.0000
        Diff (1-2)            0.00654      1.1830      0.3106

Exe_NA       Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.8889      1.6507   2.1271      1.1943      1.0479   1.3885
1                               1.8824      1.3109   2.4538      1.1114      0.8278   1.6915
Diff (1-2)    Pooled           0.00654     -0.6087   0.6218      1.1830      1.0474   1.3593
Diff (1-2)    Satterthwaite    0.00654     -0.6041   0.6172

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.02      0.9832
                 Satterthwaite    Unequal      22.827       0.02      0.9825
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                            Variable:  a_Invest_net

                             Equality of Variances

                    Method      Num DF    Den DF    F Value    Pr > F

                    Folded F        98        16       1.15    0.7822


                           Variable:  b_Use_billing_rel

        Exe_NA          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              99      1.0606      1.0863      0.1092           0      3.0000
        1              17      1.0000      1.0607      0.2572           0      3.0000
        Diff (1-2)             0.0606      1.0827      0.2842

Exe_NA        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.0606      0.8440   1.2773      1.0863      0.9532   1.2629
1                                1.0000      0.4547   1.5453      1.0607      0.7899   1.6142
Diff (1-2)    Pooled             0.0606     -0.5025   0.6237      1.0827      0.9586   1.2441
Diff (1-2)    Satterthwaite      0.0606     -0.5187   0.6399

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.21      0.8315
                 Satterthwaite    Unequal      22.165       0.22      0.8303

                             Equality of Variances

                    Method      Num DF    Den DF    F Value    Pr > F

                    Folded F        98        16       1.05    0.9747


                           Variable:  c_Gen_rev_Wholes

        Exe_NA          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              99      1.2626      0.9212      0.0926           0      3.0000
        1              17      1.1765      0.9510      0.2307           0      3.0000
        Diff (1-2)             0.0862      0.9255      0.2430
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                           Variable:  c_Gen_rev_Wholes

Exe_NA        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.2626      1.0789   1.4464      0.9212      0.8084   1.0711
1                                1.1765      0.6875   1.6654      0.9510      0.7083   1.4474
Diff (1-2)    Pooled             0.0862     -0.3952   0.5675      0.9255      0.8194   1.0634
Diff (1-2)    Satterthwaite      0.0862     -0.4300   0.6023

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.35      0.7235
                 Satterthwaite    Unequal      21.481       0.35      0.7322

                             Equality of Variances

                    Method      Num DF    Den DF    F Value    Pr > F

                    Folded F        16        98       1.07    0.7958


                          Variable:  d_Converge_net_serv

        Exe_NA          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              99      1.7879      1.0524      0.1058           0      3.0000
        1              17      1.9412      1.1440      0.2775           0      3.0000
        Diff (1-2)            -0.1533      1.0658      0.2798

Exe_NA        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.7879      1.5780   1.9978      1.0524      0.9235   1.2236
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1                             1.9412      1.3530   2.5294      1.1440      0.8520   1.7411
Diff (1-2)    Pooled         -0.1533     -0.7076   0.4010      1.0658      0.9436   1.2246
Diff (1-2)    Satterthwaite  -0.1533     -0.7710   0.4644

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.55      0.5848
                 Satterthwaite    Unequal      20.916      -0.52      0.6111

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        16        98       1.18    0.5923
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                                    Variable:  a_Access_Net

        Exe_NA          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              99      1.9293      1.1181      0.1124           0      3.0000
        1              17      2.3529      0.9315      0.2259           0      3.0000
        Diff (1-2)            -0.4236      1.0938      0.2872

Exe_NA        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                             1.9293      1.7063   2.1523      1.1181      0.9811   1.2999
1                             2.3529      1.8740   2.8319      0.9315      0.6937   1.4176
Diff (1-2)    Pooled         -0.4236     -0.9925   0.1452      1.0938      0.9684   1.2568
Diff (1-2)    Satterthwaite  -0.4236     -0.9437   0.0964

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -1.48      0.1429
                 Satterthwaite    Unequal       24.65      -1.68      0.1058

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        98        16       1.44    0.4129


                                     Variable:  b_Core_Net

        Exe_NA          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              99      1.3535      1.0431      0.1048           0      3.0000
        1              17      1.5294      1.0073      0.2443           0      3.0000
        Diff (1-2)            -0.1759      1.0381      0.2725

Exe_NA        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                             1.3535      1.1455   1.5616      1.0431      0.9153   1.2127
1                             1.5294      1.0115   2.0473      1.0073      0.7502   1.5331
Diff (1-2)    Pooled         -0.1759     -0.7158   0.3640      1.0381      0.9191   1.1929
Diff (1-2)    Satterthwaite  -0.1759     -0.7268   0.3750

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.65      0.5200
                 Satterthwaite    Unequal      22.311      -0.66      0.5150
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                                     Variable:  b_Core_Net

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        98        16       1.07    0.9295


                                   Variable:  c_Service_Apps

        Exe_NA          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              99      1.8687      1.0167      0.1022           0      3.0000
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        1              17      1.6471      0.9963      0.2416           0      3.0000
        Diff (1-2)             0.2216      1.0138      0.2662

Exe_NA        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.8687      1.6659   2.0715      1.0167      0.8921   1.1820
1                                1.6471      1.1348   2.1593      0.9963      0.7420   1.5163
Diff (1-2)    Pooled             0.2216     -0.3056   0.7489      1.0138      0.8976   1.1649
Diff (1-2)    Satterthwaite      0.2216     -0.3223   0.7656

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.83      0.4068
                 Satterthwaite    Unequal      22.118       0.84      0.4073

                                    Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        98        16       1.04    0.9896


                                   Variable:  d_QoS_monitor

        Exe_NA          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              99      0.8485      0.9515      0.0956           0      3.0000
        1              17      0.4706      0.7174      0.1740           0      2.0000
        Diff (1-2)             0.3779      0.9223      0.2421
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                                   Variable:  d_QoS_monitor

Exe_NA        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                0.8485      0.6587   1.0383      0.9515      0.8349   1.1063
1                                0.4706      0.1017   0.8395      0.7174      0.5343   1.0919
Diff (1-2)    Pooled             0.3779     -0.1017   0.8575      0.9223      0.8165   1.0597
Diff (1-2)    Satterthwaite      0.3779     -0.0297   0.7855

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       1.56      0.1214
                 Satterthwaite    Unequal      26.727       1.90      0.0678

                                    Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        98        16       1.76    0.1994


                                Variable:  a_Strategic_collab

        Exe_NA          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              99      1.6061      1.0284      0.1034           0      3.0000
        1              17      1.2353      0.7524      0.1825           0      3.0000
        Diff (1-2)             0.3708      0.9943      0.2610

Exe_NA        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.6061      1.4010   1.8112      1.0284      0.9023   1.1956
1                                1.2353      0.8484   1.6222      0.7524      0.5604   1.1452
Diff (1-2)    Pooled             0.3708     -0.1463   0.8879      0.9943      0.8803   1.1425
Diff (1-2)    Satterthwaite      0.3708     -0.0592   0.8008

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       1.42      0.1582
                 Satterthwaite    Unequal      27.448       1.77      0.0882

                                    Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        98        16       1.87    0.1561
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                              Variable:  b_Effective_regul

        Exe_NA          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              99      0.8485      1.0533      0.1059           0      3.0000
        1              17      0.5294      1.0073      0.2443           0      3.0000
        Diff (1-2)             0.3191      1.0470      0.2749

Exe_NA        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                0.8485      0.6384   1.0586      1.0533      0.9242   1.2246
1                                0.5294      0.0115   1.0473      1.0073      0.7502   1.5331
Diff (1-2)    Pooled             0.3191     -0.2254   0.8636      1.0470      0.9269   1.2030
Diff (1-2)    Satterthwaite      0.3191     -0.2325   0.8706

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       1.16      0.2481
                 Satterthwaite    Unequal      22.443       1.20      0.2433

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        98        16       1.09    0.8900


                               Variable:  c_Cont_invest

        Exe_NA          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              99      2.0606      0.9456      0.0950           0      3.0000
        1              17      2.1765      1.0146      0.2461           0      3.0000
        Diff (1-2)            -0.1159      0.9556      0.2509

Exe_NA        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                2.0606      1.8720   2.2492      0.9456      0.8298   1.0994
1                                2.1765      1.6548   2.6981      1.0146      0.7556   1.5441
Diff (1-2)    Pooled            -0.1159     -0.6129   0.3811      0.9556      0.8460   1.0981
Diff (1-2)    Satterthwaite     -0.1159     -0.6644   0.4326

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.46      0.6451
                 Satterthwaite    Unequal      21.053      -0.44      0.6650
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                               Variable:  c_Cont_invest

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        16        98       1.15    0.6421


                              Variable:  d_Bundling_serv

        Exe_NA          N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              99      1.4848      1.1099      0.1116           0      3.0000
        1              17      2.0588      0.8993      0.2181           0      3.0000
        Diff (1-2)            -0.5740      1.0828      0.2843

Exe_NA        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.4848      1.2635   1.7062      1.1099      0.9739   1.2904
1                                2.0588      1.5964   2.5212      0.8993      0.6698   1.3687
Diff (1-2)    Pooled            -0.5740     -1.1371  -0.0108      1.0828      0.9587   1.2442
Diff (1-2)    Satterthwaite     -0.5740     -1.0784  -0.0696

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -2.02      0.0458
                 Satterthwaite    Unequal      25.183      -2.34      0.0273

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F
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Method	Num DF	Den DF	F Value	Pr > F
Folded F	98	16	1.52	0.3419

Variable: a_Sys_vend_integ

Exe_NA	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	99	1.4949	1.1462	0.1152	0	3.0000
1	17	1.1176	0.9926	0.2407	0	3.0000
Diff (1-2)		0.3773	1.1259	0.2956		

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Variable: a_Sys_vend_integ

Exe_NA	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.4949	1.2663	1.7236	1.1462	1.0057	1.3326
1		1.1176	0.6073	1.6280	0.9926	0.7393	1.5107
Diff (1-2)	Pooled	0.3773	-0.2083	0.9629	1.1259	0.9968	1.2937
Diff (1-2)	Satterthwaite	0.3773	-0.1736	0.9282			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	1.28	0.2044
Satterthwaite	Unequal	23.96	1.41	0.1703

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	98	16	1.33	0.5272

Variable: b_Oth_oper_wholesale

Exe_NA	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	99	1.1010	1.0151	0.1020	0	3.0000
1	17	0.8824	1.0537	0.2556	0	3.0000
Diff (1-2)		0.2187	1.0206	0.2680		

Exe_NA	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.1010	0.8985	1.3035	1.0151	0.8907	1.1802
1		0.8824	0.3406	1.4241	1.0537	0.7848	1.6037
Diff (1-2)	Pooled	0.2187	-0.3122	0.7495	1.0206	0.9036	1.1728
Diff (1-2)	Satterthwaite	0.2187	-0.3529	0.7902			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.82	0.4162
Satterthwaite	Unequal	21.418	0.79	0.4356

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	16	98	1.08	0.7735

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Variable: c_Cont_provid

Exe_NA	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	99	1.9495	0.9516	0.0956	0	3.0000
1	17	2.2941	0.9852	0.2389	0	3.0000
Diff (1-2)		-0.3446	0.9564	0.2511		

Exe_NA	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.9495	1.7597	2.1393	0.9516	0.8350	1.1064
1		2.2941	1.7876	2.8007	0.9852	0.7337	1.4994
Diff (1-2)	Pooled	-0.3446	-0.8420	0.1528	0.9564	0.8467	1.0990
Diff (1-2)	Satterthwaite	-0.3446	-0.8792	0.1899			

Method	Variances	DF	t Value	Pr > |t|

```
                  Pooled           Equal           114      -1.37      0.1726
                  Satterthwaite    Unequal      21.448      -1.34      0.1946

                                    Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F        16        98       1.07    0.7841


                                  Variable:  d_Net_co_Skype

         Exe_NA          N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              99      1.4545      1.1976      0.1204           0      3.0000
         1              17      1.7059      0.9852      0.2389           0      3.0000
         Diff (1-2)            -0.2513      1.1701      0.3072

 Exe_NA        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                                1.4545      1.2157   1.6934      1.1976      1.0508   1.3923
 1                                1.7059      1.1993   2.2124      0.9852      0.7337   1.4994
 Diff (1-2)    Pooled            -0.2513     -0.8599   0.3572      1.1701      1.0359   1.3445
 Diff (1-2)    Satterthwaite     -0.2513     -0.8025   0.2998

                  Method           Variances        DF    t Value    Pr > |t|

                  Pooled           Equal           114      -0.82      0.4150
                  Satterthwaite    Unequal      24.888      -0.94      0.3565
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                                  Variable:  d_Net_co_Skype

                                    Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F        98        16       1.48    0.3795


                                   Variable:  a_Int_resist

         Exe_NA          N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              99      1.6364      1.0347      0.1040           0      3.0000
         1              17      2.0000      1.0607      0.2572           0      3.0000
         Diff (1-2)            -0.3636      1.0383      0.2726

 Exe_NA        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                                1.6364      1.4300   1.8427      1.0347      0.9079   1.2029
 1                                2.0000      1.4547   2.5453      1.0607      0.7899   1.6142
 Diff (1-2)    Pooled            -0.3636     -0.9037   0.1764      1.0383      0.9193   1.1931
 Diff (1-2)    Satterthwaite     -0.3636     -0.9398   0.2125

                  Method           Variances        DF    t Value    Pr > |t|

                  Pooled           Equal           114      -1.33      0.1849
                  Satterthwaite    Unequal      21.562      -1.31      0.2038

                                    Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F        16        98       1.05    0.8243


                                  Variable:  b_Out_date_bus

         Exe_NA          N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              99      2.3636      0.8743      0.0879           0      3.0000
         1              17      2.0000      0.9354      0.2269           0      3.0000
         Diff (1-2)             0.3636      0.8831      0.2319
```

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                                  Variable:  b_Out_date_bus
```

Exe_NA	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		2.3636	2.1893	2.5380	0.8743	0.7672	1.0165
1		2.0000	1.5191	2.4809	0.9354	0.6967	1.4236
Diff (1-2)	Pooled	0.3636	-0.0957	0.8229	0.8831	0.7819	1.0148
Diff (1-2)	Satterthwaite	0.3636	-0.1422	0.8695			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	1.57	0.1196
Satterthwaite	Unequal	21.083	1.49	0.1498

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	16	98	1.14	0.6529

Variable: c_Erod_profit

Exe_NA	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	99	1.2121	0.9612	0.0966	0	3.0000
1	17	1.4118	1.1213	0.2720	0	3.0000
Diff (1-2)		-0.1996	0.9853	0.2587		

Exe_NA	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.2121	1.0204	1.4038	0.9612	0.8434	1.1175
1		1.4118	0.8352	1.9883	1.1213	0.8351	1.7066
Diff (1-2)	Pooled	-0.1996	-0.7121	0.3128	0.9853	0.8723	1.1321
Diff (1-2)	Satterthwaite	-0.1996	-0.8012	0.4019			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-0.77	0.4418
Satterthwaite	Unequal	20.24	-0.69	0.4970

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	16	98	1.36	0.3552

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Variable: d_Much_reg

Exe_NA	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	99	0.7879	0.9612	0.0966	0	3.0000
1	17	0.5882	0.7952	0.1929	0	2.0000
Diff (1-2)		0.1996	0.9397	0.2467		

Exe_NA	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.7879	0.5962	0.9796	0.9612	0.8434	1.1175
1		0.5882	0.1794	0.9971	0.7952	0.5922	1.2102
Diff (1-2)	Pooled	0.1996	-0.2891	0.6884	0.9397	0.8319	1.0797
Diff (1-2)	Satterthwaite	0.1996	-0.2448	0.6441			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.81	0.4201
Satterthwaite	Unequal	24.781	0.93	0.3636

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	98	16	1.46	0.3941

Variable: a_Mod_scalable

Exe_NA	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	99	2.2121	0.8363	0.0841	0	3.0000
1	17	2.0000	0.9354	0.2269	0	3.0000
Diff (1-2)		0.2121	0.8509	0.2234		

```
     Exe_NA        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

     0                                2.2121      2.0453   2.3789      0.8363      0.7338   0.9723
     1                                2.0000      1.5191   2.4809      0.9354      0.6967   1.4236
     Diff (1-2)    Pooled             0.2121     -0.2304   0.6547      0.8509      0.7534   0.9778
     Diff (1-2)    Satterthwaite      0.2121     -0.2916   0.7158

                      Method           Variances        DF    t Value    Pr > |t|

                      Pooled           Equal           114       0.95      0.3444
                      Satterthwaite    Unequal       20.63       0.88      0.3907
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                                  Variable:  a_Mod_scalable

                                    Equality of Variances

                           Method      Num DF    Den DF    F Value    Pr > F

                           Folded F        16        98       1.25    0.4895


                                  Variable:  b_One_stop_shop

             Exe_NA          N        Mean     Std Dev     Std Err     Minimum     Maximum

             0              99      1.8687      0.9861      0.0991           0      3.0000
             1              17      1.5882      1.2776      0.3099           0      3.0000
             Diff (1-2)             0.2805      1.0320      0.2709

     Exe_NA        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

     0                                1.8687      1.6720   2.0654      0.9861      0.8653   1.1465
     1                                1.5882      0.9313   2.2451      1.2776      0.9515   1.9445
     Diff (1-2)    Pooled             0.2805     -0.2563   0.8172      1.0320      0.9137   1.1858
     Diff (1-2)    Satterthwaite      0.2805     -0.3995   0.9604

                      Method           Variances        DF    t Value    Pr > |t|

                      Pooled           Equal           114       1.04      0.3028
                      Satterthwaite    Unequal      19.408       0.86      0.3992

                                    Equality of Variances

                           Method      Num DF    Den DF    F Value    Pr > F

                           Folded F        16        98       1.68    0.1270


                                    Variable:  c_Lean_org

             Exe_NA          N        Mean     Std Dev     Std Err     Minimum     Maximum

             0              99      1.5758      0.9157      0.0920           0      3.0000
             1              17      1.7059      0.9852      0.2389           0      3.0000
             Diff (1-2)            -0.1301      0.9258      0.2431
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                                    Variable:  c_Lean_org

     Exe_NA        Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

     0                                1.5758      1.3931   1.7584      0.9157      0.8035   1.0647
     1                                1.7059      1.1993   2.2124      0.9852      0.7337   1.4994
     Diff (1-2)    Pooled            -0.1301     -0.6116   0.3514      0.9258      0.8196   1.0638
     Diff (1-2)    Satterthwaite     -0.1301     -0.6626   0.4023

                      Method           Variances        DF    t Value    Pr > |t|

                      Pooled           Equal           114      -0.54      0.5934
                      Satterthwaite    Unequal      21.024      -0.51      0.6166

                                    Equality of Variances

                           Method      Num DF    Den DF    F Value    Pr > F

                           Folded F        16        98       1.16    0.6317
```

Variable: d_Max_cont_mono

Exe_NA	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	99	0.3434	0.7307	0.0734	0	3.0000
1	17	0.7059	0.9196	0.2230	0	3.0000
Diff (1-2)		-0.3624	0.7600	0.1995		

Exe_NA	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.3434	0.1977	0.4892	0.7307	0.6412	0.8495
1		0.7059	0.2331	1.1787	0.9196	0.6849	1.3995
Diff (1-2)	Pooled	-0.3624	-0.7577	0.0328	0.7600	0.6729	0.8733
Diff (1-2)	Satterthwaite	-0.3624	-0.8529	0.1280			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-1.82	0.0719
Satterthwaite	Unequal	19.62	-1.54	0.1387

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	16	98	1.58	0.1749

Background Bias: Executive Operators-test

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                                        Variable:  a_Existing_rel

          Exe_Oper         N        Mean     Std Dev     Std Err     Minimum     Maximum

          0              105      1.9143      1.1190      0.1092           0      3.0000
          1               11      2.3636      0.8090      0.2439      1.0000      3.0000
          Diff (1-2)             -0.4494      1.0953      0.3471

  Exe_Oper      Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

  0                                1.9143      1.6977   2.1308      1.1190      0.9854   1.2949
  1                                2.3636      1.8201   2.9072      0.8090      0.5653   1.4198
  Diff (1-2)    Pooled            -0.4494     -1.1370   0.2383      1.0953      0.9697   1.2586
  Diff (1-2)    Satterthwaite     -0.4494     -1.0212   0.1225

                     Method           Variances        DF    t Value    Pr > |t|

                     Pooled           Equal           114      -1.29      0.1981
                     Satterthwaite    Unequal      14.355      -1.68      0.1143

                                          Equality of Variances

                          Method      Num DF    Den DF    F Value    Pr > F

                          Folded F       104        10       1.91    0.2586


                                        Variable:  b_Own_phys_net

          Exe_Oper         N        Mean     Std Dev     Std Err     Minimum     Maximum

          0              105      1.3238      1.0606      0.1035           0      3.0000
          1               11      1.5455      1.0357      0.3123           0      3.0000
          Diff (1-2)             -0.2216      1.0585      0.3354

  Exe_Oper      Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

  0                                1.3238      1.1186   1.5291      1.0606      0.9340   1.2273
  1                                1.5455      0.8496   2.2413      1.0357      0.7237   1.8176
  Diff (1-2)    Pooled            -0.2216     -0.8861   0.4429      1.0585      0.9371   1.2162
  Diff (1-2)    Satterthwaite     -0.2216     -0.9365   0.4932

                     Method           Variances        DF    t Value    Pr > |t|

                     Pooled           Equal           114      -0.66      0.5101
                     Satterthwaite    Unequal      12.304      -0.67      0.5130
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                                        Variable:  b_Own_phys_net

                                          Equality of Variances

                          Method      Num DF    Den DF    F Value    Pr > F

                          Folded F       104        10       1.05    1.0000


                                           Variable:  c_Fin_str

          Exe_Oper         N        Mean     Std Dev     Std Err     Minimum     Maximum

          0              105      1.5429      1.0287      0.1004           0      3.0000
          1               11      1.4545      0.9342      0.2817           0      3.0000
          Diff (1-2)              0.0883      1.0208      0.3235

  Exe_Oper      Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

  0                                1.5429      1.3438   1.7419      1.0287      0.9059   1.1904
  1                                1.4545      0.8269   2.0821      0.9342      0.6527   1.6395
  Diff (1-2)    Pooled             0.0883     -0.5525   0.7291      1.0208      0.9037   1.1729
  Diff (1-2)    Satterthwaite      0.0883     -0.5593   0.7360

                     Method           Variances        DF    t Value    Pr > |t|
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                  Pooled           Equal           114       0.27      0.7854
                  Satterthwaite    Unequal      12.682       0.30      0.7725

                                   Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F       104        10       1.21    0.7886


                                   Variable:  d_Reput_exp

         Exe_Oper         N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              105      1.2190      1.1518      0.1124           0      3.0000
         1               11      0.6364      1.1201      0.3377           0      3.0000
         Diff (1-2)              0.5827      1.1490      0.3641
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                                   Variable:  d_Reput_exp

 Exe_Oper      Method                Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                                 1.2190      0.9962   1.4419      1.1518      1.0143   1.3327
 1                                 0.6364     -0.1161   1.3888      1.1201      0.7826   1.9656
 Diff (1-2)    Pooled              0.5827     -0.1387   1.3040      1.1490      1.0173   1.3203
 Diff (1-2)    Satterthwaite       0.5827     -0.1906   1.3559

                  Method           Variances        DF    t Value    Pr > |t|

                  Pooled           Equal           114       1.60      0.1123
                  Satterthwaite    Unequal      12.324       1.64      0.1269

                                   Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F       104        10       1.06    1.0000


                                 Variable:  a_Outdated_net

         Exe_Oper         N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              105      1.6381      1.0842      0.1058           0      3.0000
         1               11      1.6364      0.6742      0.2033           0      2.0000
         Diff (1-2)             0.00173      1.0546      0.3342

 Exe_Oper      Method                Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                                 1.6381      1.4283   1.8479      1.0842      0.9547   1.2545
 1                                 1.6364      1.1834   2.0893      0.6742      0.4711   1.1832
 Diff (1-2)    Pooled             0.00173     -0.6604   0.6638      1.0546      0.9337   1.2118
 Diff (1-2)    Satterthwaite      0.00173     -0.4840   0.4874

                  Method           Variances        DF    t Value    Pr > |t|

                  Pooled           Equal           114       0.01      0.9959
                  Satterthwaite    Unequal      16.039       0.01      0.9941

                                   Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F       104        10       2.59    0.1001
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                                 Variable:  b_Low_serv_qual

         Exe_Oper         N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              105      2.0952      1.0518      0.1026           0      3.0000
         1               11      2.6364      0.8090      0.2439      1.0000      3.0000
         Diff (1-2)             -0.5411      1.0328      0.3273

 Exe_Oper      Method                Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                                 2.0952      1.8917   2.2988      1.0518      0.9262   1.2170
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1                            2.6364      2.0928   3.1799      0.8090      0.5653   1.4198
Diff (1-2)    Pooled        -0.5411     -1.1895   0.1072      1.0328      0.9143   1.1867
Diff (1-2)    Satterthwaite -0.5411     -1.1095   0.0272

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -1.65      0.1010
                 Satterthwaite    Unequal      13.813      -2.04      0.0604

                                  Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       104        10       1.69    0.3649


                                 Variable:  c_Expen_telec

        Exe_Oper         N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              105      1.0476      0.9646      0.0941           0      3.0000
        1               11      0.6364      0.6742      0.2033           0      2.0000
        Diff (1-2)              0.4113      0.9427      0.2987

Exe_Oper      Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                              1.0476      0.8610   1.2343      0.9646      0.8494   1.1161
1                              0.6364      0.1834   1.0893      0.6742      0.4711   1.1832
Diff (1-2)    Pooled           0.4113     -0.1806   1.0031      0.9427      0.8346   1.0832
Diff (1-2)    Satterthwaite    0.4113     -0.0671   0.8896

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       1.38      0.1713
                 Satterthwaite    Unequal      14.684       1.84      0.0867
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                                 Variable:  c_Expen_telec

                                  Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       104        10       2.05    0.2117


                                 Variable:  d_Limit_rigid

        Exe_Oper         N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              105      1.2190      1.0829      0.1057           0      3.0000
        1               11      1.0909      1.2210      0.3682           0      3.0000
        Diff (1-2)              0.1281      1.0957      0.3472

Exe_Oper      Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                              1.2190      1.0095   1.4286      1.0829      0.9536   1.2531
1                              1.0909      0.2706   1.9112      1.2210      0.8532   2.1428
Diff (1-2)    Pooled           0.1281     -0.5598   0.8160      1.0957      0.9701   1.2591
Diff (1-2)    Satterthwaite    0.1281     -0.7087   0.9650

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.37      0.7128
                 Satterthwaite    Unequal      11.708       0.33      0.7439

                                  Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        10       104       1.27    0.5125


                              Variable:  a_Oth_telcos_attack

        Exe_Oper         N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              105      1.7143      0.9778      0.0954           0      3.0000
        1               11      1.6364      0.6742      0.2033      1.0000      3.0000
        Diff (1-2)              0.0779      0.9550      0.3027
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Variable: a_Oth_telcos_attack

Exe_Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.7143	1.5251	1.9035	0.9778	0.8610	1.1314
1		1.6364	1.1834	2.0893	0.6742	0.4711	1.1832
Diff (1-2)	Pooled	0.0779	-0.5216	0.6775	0.9550	0.8455	1.0974
Diff (1-2)	Satterthwaite	0.0779	-0.4012	0.5571			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.26	0.7973
Satterthwaite	Unequal	14.823	0.35	0.7335

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	104	10	2.10	0.1949

Variable: b_Cable_Sat_Wire

Exe_Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	105	2.1048	0.8427	0.0822	0	3.0000
1	11	1.5455	0.8202	0.2473	0	3.0000
Diff (1-2)		0.5593	0.8407	0.2664		

Exe_Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		2.1048	1.9417	2.2678	0.8427	0.7421	0.9751
1		1.5455	0.9944	2.0965	0.8202	0.5731	1.4394
Diff (1-2)	Pooled	0.5593	0.0315	1.0871	0.8407	0.7443	0.9660
Diff (1-2)	Satterthwaite	0.5593	-0.00689	1.1255			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	2.10	0.0380
Satterthwaite	Unequal	12.319	2.15	0.0524

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	104	10	1.06	1.0000

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Variable: c_Equip_vend_sys

Exe_Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	105	0.5333	0.7604	0.0742	0	3.0000
1	11	0.1818	0.4045	0.1220	0	1.0000
Diff (1-2)		0.3515	0.7361	0.2333		

Exe_Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.5333	0.3862	0.6805	0.7604	0.6696	0.8799
1		0.1818	-0.0899	0.4536	0.4045	0.2826	0.7099
Diff (1-2)	Pooled	0.3515	-0.1106	0.8136	0.7361	0.6517	0.8458
Diff (1-2)	Satterthwaite	0.3515	0.0522	0.6508			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	1.51	0.1346
Satterthwaite	Unequal	18.53	2.46	0.0238

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	104	10	3.53	0.0326

Variable: d_Co_understa

Exe_Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	105	1.6476	1.1928	0.1164	0	3.0000
1	11	2.6364	0.9244	0.2787	0	3.0000
Diff (1-2)		-0.9887	1.1717	0.3713		

Exe_Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.6476	1.4168	1.8785	1.1928	1.0504	1.3802
1		2.6364	2.0153	3.2574	0.9244	0.6459	1.6223
Diff (1-2)	Pooled	-0.9887	-1.7243	-0.2532	1.1717	1.0373	1.3463
Diff (1-2)	Satterthwaite	-0.9887	-1.6377	-0.3398			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-2.66	0.0089
Satterthwaite	Unequal	13.752	-3.27	0.0057

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Variable: d_Co_understa

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	104	10	1.66	0.3798

Variable: a_Bus_serv_cloud

Exe_Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	105	2.2952	0.8762	0.0855	0	3.0000
1	11	2.0909	1.0445	0.3149	0	3.0000
Diff (1-2)		0.2043	0.8923	0.2828		

Exe_Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		2.2952	2.1257	2.4648	0.8762	0.7716	1.0139
1		2.0909	1.3892	2.7926	1.0445	0.7298	1.8330
Diff (1-2)	Pooled	0.2043	-0.3558	0.7645	0.8923	0.7899	1.0252
Diff (1-2)	Satterthwaite	0.2043	-0.5099	0.9186			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.72	0.4714
Satterthwaite	Unequal	11.523	0.63	0.5434

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	10	104	1.42	0.3627

Variable: b_Ultra_speed_Inter

Exe_Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	105	1.2857	1.0351	0.1010	0	3.0000
1	11	1.1818	1.0787	0.3252	0	3.0000
Diff (1-2)		0.1039	1.0390	0.3293		

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Variable: b_Ultra_speed_Inter

Exe_Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.2857	1.0854	1.4860	1.0351	0.9115	1.1977
1		1.1818	0.4571	1.9065	1.0787	0.7537	1.8931
Diff (1-2)	Pooled	0.1039	-0.5484	0.7562	1.0390	0.9199	1.1939
Diff (1-2)	Satterthwaite	0.1039	-0.6381	0.8459			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.32	0.7529
Satterthwaite	Unequal	12.012	0.31	0.7655

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                              Equality of Variances

                    Method      Num DF    Den DF    F Value    Pr > F

                    Folded F        10       104       1.09    0.7594


                             Variable:  c_New_revenues

         Exe_Oper         N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              105      1.7048      0.9896      0.0966           0      3.0000
         1               11      2.0909      0.7006      0.2113      1.0000      3.0000
         Diff (1-2)             -0.3861      0.9677      0.3067

   Exe_Oper      Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

   0                               1.7048      1.5133   1.8963      0.9896      0.8715   1.1451
   1                               2.0909      1.6202   2.5616      0.7006      0.4896   1.2296
   Diff (1-2)    Pooled           -0.3861     -0.9937   0.2214      0.9677      0.8567   1.1120
   Diff (1-2)    Satterthwaite    -0.3861     -0.8826   0.1103

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -1.26      0.2106
                 Satterthwaite    Unequal      14.555      -1.66      0.1178

                              Equality of Variances

                    Method      Num DF    Den DF    F Value    Pr > F

                    Folded F       104        10       1.99    0.2287
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                            Variable:  d_Smart_home_sol

         Exe_Oper         N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              105      0.7143      0.9376      0.0915           0      3.0000
         1               11      0.6364      1.0269      0.3096           0      3.0000
         Diff (1-2)              0.0779      0.9458      0.2997

   Exe_Oper      Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

   0                               0.7143      0.5328   0.8957      0.9376      0.8257   1.0849
   1                               0.6364     -0.0535   1.3263      1.0269      0.7175   1.8022
   Diff (1-2)    Pooled            0.0779     -0.5158   0.6717      0.9458      0.8373   1.0868
   Diff (1-2)    Satterthwaite     0.0779     -0.6268   0.7826

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.26      0.7954
                 Satterthwaite    Unequal      11.814       0.24      0.8134

                              Equality of Variances

                    Method      Num DF    Den DF    F Value    Pr > F

                    Folded F        10       104       1.20    0.5999


                              Variable:  a_Invest_net

         Exe_Oper         N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              105      1.8762      1.1824      0.1154           0      3.0000
         1               11      2.0000      1.1832      0.3568           0      3.0000
         Diff (1-2)             -0.1238      1.1824      0.3747

   Exe_Oper      Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

   0                               1.8762      1.6474   2.1050      1.1824      1.0412   1.3682
   1                               2.0000      1.2051   2.7949      1.1832      0.8267   2.0765
   Diff (1-2)    Pooled           -0.1238     -0.8661   0.6185      1.1824      1.0469   1.3587
   Diff (1-2)    Satterthwaite    -0.1238     -0.9394   0.6917

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.33      0.7417
                 Satterthwaite    Unequal      12.189      -0.33      0.7469
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                           Variable:  a_Invest_net

                            Equality of Variances

              Method      Num DF    Den DF    F Value    Pr > F

              Folded F        10       104       1.00    0.8946


                         Variable:  b_Use_billing_rel

       Exe_Oper         N        Mean     Std Dev     Std Err     Minimum     Maximum

       0              105      1.0571      1.0726      0.1047           0      3.0000
       1               11      1.0000      1.1832      0.3568           0      3.0000
       Diff (1-2)              0.0571      1.0828      0.3431

Exe_Oper      Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.0571      0.8496   1.2647      1.0726      0.9446   1.2412
1                                1.0000      0.2051   1.7949      1.1832      0.8267   2.0765
Diff (1-2)    Pooled             0.0571     -0.6226   0.7369      1.0828      0.9586   1.2442
Diff (1-2)    Satterthwaite      0.0571     -0.7545   0.8688

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.17      0.8680
                 Satterthwaite    Unequal      11.788       0.15      0.8804

                            Equality of Variances

              Method      Num DF    Den DF    F Value    Pr > F

              Folded F        10       104       1.22    0.5779


                         Variable:  c_Gen_rev_Wholes

       Exe_Oper         N        Mean     Std Dev     Std Err     Minimum     Maximum

       0              105      1.2762      0.9146      0.0893           0      3.0000
       1               11      1.0000      1.0000      0.3015           0      3.0000
       Diff (1-2)              0.2762      0.9224      0.2923
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                         Variable:  c_Gen_rev_Wholes

Exe_Oper      Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.2762      1.0992   1.4532      0.9146      0.8054   1.0583
1                                1.0000      0.3282   1.6718      1.0000      0.6987   1.7549
Diff (1-2)    Pooled             0.2762     -0.3029   0.8553      0.9224      0.8166   1.0599
Diff (1-2)    Satterthwaite      0.2762     -0.4101   0.9625

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.94      0.3467
                 Satterthwaite    Unequal      11.821       0.88      0.3973

                            Equality of Variances

              Method      Num DF    Den DF    F Value    Pr > F

              Folded F        10       104       1.20    0.6051


                        Variable:  d_Converge_net_serv

       Exe_Oper         N        Mean     Std Dev     Std Err     Minimum     Maximum

       0              105      1.7905      1.0892      0.1063           0      3.0000
       1               11      2.0000      0.7746      0.2335      1.0000      3.0000
       Diff (1-2)             -0.2095      1.0654      0.3376

Exe_Oper      Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.7905      1.5797   2.0013      1.0892      0.9592   1.2604
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    1                           2.0000      1.4796   2.5204      0.7746      0.5412   1.3594
    Diff (1-2)    Pooled       -0.2095     -0.8784   0.4593      1.0654      0.9432   1.2242
    Diff (1-2)    Satterthwaite  -0.2095   -0.7581   0.3390

                  Method           Variances        DF    t Value    Pr > |t|

                  Pooled           Equal           114      -0.62      0.5361
                  Satterthwaite    Unequal      14.512      -0.82      0.4274

                                   Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F       104        10       1.98    0.2347
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                                  Variable:  a_Access_Net

            Exe_Oper         N        Mean     Std Dev     Std Err     Minimum     Maximum

            0              105      1.9905      1.1050      0.1078           0      3.0000
            1               11      2.0000      1.0954      0.3303           0      3.0000
            Diff (1-2)            -0.00952      1.1042      0.3499

    Exe_Oper      Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

    0                                1.9905      1.7766   2.2043      1.1050      0.9731   1.2787
    1                                2.0000      1.2641   2.7359      1.0954      0.7654   1.9224
    Diff (1-2)    Pooled           -0.00952     -0.7027   0.6837      1.1042      0.9776   1.2688
    Diff (1-2)    Satterthwaite    -0.00952     -0.7650   0.7459

                  Method           Variances        DF    t Value    Pr > |t|

                  Pooled           Equal           114      -0.03      0.9783
                  Satterthwaite    Unequal      12.232      -0.03      0.9786

                                   Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F       104        10       1.02    1.0000


                                   Variable:  b_Core_Net

            Exe_Oper         N        Mean     Std Dev     Std Err     Minimum     Maximum

            0              105      1.4381      1.0277      0.1003           0      3.0000
            1               11      0.8182      0.9816      0.2960           0      3.0000
            Diff (1-2)              0.6199      1.0238      0.3244

    Exe_Oper      Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

    0                                1.4381      1.2392   1.6370      1.0277      0.9050   1.1892
    1                                0.8182      0.1587   1.4777      0.9816      0.6859   1.7227
    Diff (1-2)    Pooled             0.6199     -0.0228   1.2626      1.0238      0.9064   1.1764
    Diff (1-2)    Satterthwaite      0.6199     -0.0585   1.2983

                  Method           Variances        DF    t Value    Pr > |t|

                  Pooled           Equal           114       1.91      0.0586
                  Satterthwaite    Unequal      12.413       1.98      0.0699
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                                   Variable:  b_Core_Net

                                   Equality of Variances

                       Method      Num DF    Den DF    F Value    Pr > F

                       Folded F       104        10       1.10    0.9502


                                 Variable:  c_Service_Apps

            Exe_Oper         N        Mean     Std Dev     Std Err     Minimum     Maximum

            0              105      1.7714      1.0215      0.0997           0      3.0000
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        1               11      2.4545      0.6876      0.2073      1.0000      3.0000
        Diff (1-2)             -0.6831      0.9967      0.3159

Exe_Oper      Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.7714      1.5737   1.9691      1.0215      0.8995   1.1820
1                                2.4545      1.9926   2.9164      0.6876      0.4804   1.2066
Diff (1-2)    Pooled            -0.6831     -1.3088  -0.0574      0.9967      0.8824   1.1452
Diff (1-2)    Satterthwaite     -0.6831     -1.1732  -0.1931

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -2.16      0.0326
                 Satterthwaite    Unequal      15.082      -2.97      0.0095

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       104        10       2.21    0.1679


                                  Variable:  d_QoS_monitor

        Exe_Oper         N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              105      0.8000      0.9547      0.0932           0      3.0000
        1               11      0.7273      0.6467      0.1950           0      2.0000
        Diff (1-2)              0.0727      0.9318      0.2953
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                                  Variable:  d_QoS_monitor

Exe_Oper      Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                0.8000      0.6152   0.9848      0.9547      0.8408   1.1048
1                                0.7273      0.2928   1.1617      0.6467      0.4518   1.1349
Diff (1-2)    Pooled             0.0727     -0.5123   0.6577      0.9318      0.8250   1.0707
Diff (1-2)    Satterthwaite      0.0727     -0.3878   0.5333

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.25      0.8059
                 Satterthwaite    Unequal      15.013       0.34      0.7411

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       104        10       2.18    0.1746


                               Variable:  a_Strategic_collab

        Exe_Oper         N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              105      1.5429      1.0287      0.1004           0      3.0000
        1               11      1.6364      0.6742      0.2033      1.0000      3.0000
        Diff (1-2)             -0.0935      1.0026      0.3177

Exe_Oper      Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.5429      1.3438   1.7419      1.0287      0.9059   1.1904
1                                1.6364      1.1834   2.0893      0.6742      0.4711   1.1832
Diff (1-2)    Pooled            -0.0935     -0.7230   0.5359      1.0026      0.8877   1.1521
Diff (1-2)    Satterthwaite     -0.0935     -0.5757   0.3887

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.29      0.7691
                 Satterthwaite    Unequal      15.385      -0.41      0.6857

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       104        10       2.33    0.1416
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Variable: b_Effective_regul

Exe_Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	105	0.8190	1.0357	0.1011	0	3.0000
1	11	0.6364	1.2060	0.3636	0	3.0000
Diff (1-2)		0.1827	1.0518	0.3333		

Exe_Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.8190	0.6186	1.0195	1.0357	0.9121	1.1985
1		0.6364	-0.1739	1.4466	1.2060	0.8427	2.1165
Diff (1-2)	Pooled	0.1827	-0.4776	0.8430	1.0518	0.9312	1.2085
Diff (1-2)	Satterthwaite	0.1827	-0.6428	1.0082			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.55	0.5847
Satterthwaite	Unequal	11.598	0.48	0.6374

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	10	104	1.36	0.4226

Variable: c_Cont_invest

Exe_Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	105	2.0476	0.9342	0.0912	0	3.0000
1	11	2.3636	1.1201	0.3377	0	3.0000
Diff (1-2)		-0.3160	0.9519	0.3017		

Exe_Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		2.0476	1.8668	2.2284	0.9342	0.8227	1.0810
1		2.3636	1.6112	3.1161	1.1201	0.7826	1.9656
Diff (1-2)	Pooled	-0.3160	-0.9136	0.2816	0.9519	0.8428	1.0938
Diff (1-2)	Satterthwaite	-0.3160	-1.0818	0.4498			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-1.05	0.2971
Satterthwaite	Unequal	11.505	-0.90	0.3848

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Variable: c_Cont_invest

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	10	104	1.44	0.3485

Variable: d_Bundling_serv

Exe_Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	105	1.5905	1.1240	0.1097	0	3.0000
1	11	1.3636	0.8090	0.2439	0	2.0000
Diff (1-2)		0.2268	1.1000	0.3486		

Exe_Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.5905	1.3730	1.8080	1.1240	0.9898	1.3006
1		1.3636	0.8201	1.9072	0.8090	0.5653	1.4198
Diff (1-2)	Pooled	0.2268	-0.4637	0.9174	1.1000	0.9739	1.2639
Diff (1-2)	Satterthwaite	0.2268	-0.3453	0.7990			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.65	0.5165
Satterthwaite	Unequal	14.396	0.85	0.4103

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F

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                     Folded F       104        10       1.93    0.2520


                                Variable:  a_Sys_vend_integ

        Exe_Oper         N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              105      1.4952      1.1613      0.1133           0      3.0000
        1               11      0.9091      0.5394      0.1626           0      2.0000
        Diff (1-2)              0.5861      1.1206      0.3551
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                                Variable:  a_Sys_vend_integ

Exe_Oper      Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.4952      1.2705   1.7200      1.1613      1.0226   1.3437
1                                0.9091      0.5467   1.2714      0.5394      0.3769   0.9465
Diff (1-2)    Pooled             0.5861     -0.1174   1.2897      1.1206      0.9921   1.2876
Diff (1-2)    Satterthwaite      0.5861      0.1746   0.9977

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       1.65      0.1016
                 Satterthwaite    Unequal      21.582       2.96      0.0074

                                     Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       104        10       4.64    0.0112


                              Variable:  b_Oth_oper_wholesale

        Exe_Oper         N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              105      1.0857      1.0011      0.0977           0      3.0000
        1               11      0.9091      1.2210      0.3682           0      3.0000
        Diff (1-2)              0.1766      1.0223      0.3240

Exe_Oper      Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.0857      0.8920   1.2795      1.0011      0.8816   1.1584
1                                0.9091      0.0888   1.7294      1.2210      0.8532   2.1428
Diff (1-2)    Pooled             0.1766     -0.4652   0.8184      1.0223      0.9051   1.1747
Diff (1-2)    Satterthwaite      0.1766     -0.6577   1.0109

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.55      0.5867
                 Satterthwaite    Unequal      11.453       0.46      0.6515

                                     Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        10       104       1.49    0.3087
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                                  Variable:  c_Cont_provid

        Exe_Oper         N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              105      1.9333      0.9634      0.0940           0      3.0000
        1               11      2.6364      0.6742      0.2033      1.0000      3.0000
        Diff (1-2)             -0.7030      0.9416      0.2984

Exe_Oper      Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.9333      1.7469   2.1198      0.9634      0.8484   1.1148
1                                2.6364      2.1834   3.0893      0.6742      0.4711   1.1832
Diff (1-2)    Pooled            -0.7030     -1.2942  -0.1119      0.9416      0.8337   1.0820
Diff (1-2)    Satterthwaite     -0.7030     -1.1813  -0.2247

                 Method           Variances        DF    t Value    Pr > |t|
```

```
                 Pooled           Equal           114      -2.36      0.0202
                 Satterthwaite    Unequal      14.672      -3.14      0.0069

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       104        10       2.04    0.2132


                                 Variable:  d_Net_co_Skype

        Exe_Oper         N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              105      1.4857      1.1858      0.1157           0      3.0000
        1               11      1.5455      1.0357      0.3123           0      3.0000
        Diff (1-2)             -0.0597      1.1734      0.3719

Exe_Oper      Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.4857      1.2562   1.7152      1.1858      1.0442   1.3721
1                                1.5455      0.8496   2.2413      1.0357      0.7237   1.8176
Diff (1-2)    Pooled            -0.0597     -0.7964   0.6769      1.1734      1.0388   1.3483
Diff (1-2)    Satterthwaite     -0.0597     -0.7797   0.6602

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.16      0.8726
                 Satterthwaite    Unequal      12.911      -0.18      0.8604
```

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                                 Variable:  d_Net_co_Skype

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       104        10       1.31    0.6724


                                  Variable:  a_Int_resist

        Exe_Oper         N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              105      1.7048      1.0645      0.1039           0      3.0000
        1               11      1.5455      0.8202      0.2473           0      3.0000
        Diff (1-2)              0.1593      1.0454      0.3313

Exe_Oper      Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.7048      1.4988   1.9108      1.0645      0.9374   1.2318
1                                1.5455      0.9944   2.0965      0.8202      0.5731   1.4394
Diff (1-2)    Pooled             0.1593     -0.4970   0.8156      1.0454      0.9255   1.2012
Diff (1-2)    Satterthwaite      0.1593     -0.4168   0.7354

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.48      0.6315
                 Satterthwaite    Unequal      13.799       0.59      0.5622

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F       104        10       1.68    0.3682


                                 Variable:  b_Out_date_bus

        Exe_Oper         N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              105      2.2476      0.9070      0.0885           0      3.0000
        1               11      2.9091      0.3015      0.0909      2.0000      3.0000
        Diff (1-2)             -0.6615      0.8709      0.2760
```

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                                 Variable:  b_Out_date_bus
```

Exe_Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		2.2476	2.0721	2.4232	0.9070	0.7987	1.0496
1		2.9091	2.7065	3.1116	0.3015	0.2107	0.5291
Diff (1-2)	Pooled	-0.6615	-1.2082	-0.1147	0.8709	0.7711	1.0007
Diff (1-2)	Satterthwaite	-0.6615	-0.9191	-0.4039			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-2.40	0.0182
Satterthwaite	Unequal	34.931	-5.21	<.0001

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	104	10	9.05	0.0006

Variable: c_Erod_profit

Exe_Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	105	1.2952	0.9993	0.0975	0	3.0000
1	11	0.7273	0.6467	0.1950	0	2.0000
Diff (1-2)		0.5680	0.9735	0.3085		

Exe_Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.2952	1.1019	1.4886	0.9993	0.8800	1.1563
1		0.7273	0.2928	1.1617	0.6467	0.4518	1.1349
Diff (1-2)	Pooled	0.5680	-0.0432	1.1791	0.9735	0.8618	1.1186
Diff (1-2)	Satterthwaite	0.5680	0.1047	1.0312			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	1.84	0.0682
Satterthwaite	Unequal	15.535	2.61	0.0195

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	104	10	2.39	0.1305

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Variable: d_Much_reg

Exe_Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	105	0.7524	0.9383	0.0916	0	3.0000
1	11	0.8182	0.9816	0.2960	0	2.0000
Diff (1-2)		-0.0658	0.9422	0.2986		

Exe_Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.7524	0.5708	0.9340	0.9383	0.8263	1.0857
1		0.8182	0.1587	1.4777	0.9816	0.6859	1.7227
Diff (1-2)	Pooled	-0.0658	-0.6573	0.5257	0.9422	0.8341	1.0826
Diff (1-2)	Satterthwaite	-0.0658	-0.7409	0.6093			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-0.22	0.8260
Satterthwaite	Unequal	11.995	-0.21	0.8354

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	10	104	1.09	0.7466

Variable: a_Mod_scalable

Exe_Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	105	2.1810	0.8524	0.0832	0	3.0000
1	11	2.1818	0.8739	0.2635	1.0000	3.0000
Diff (1-2)		-0.00087	0.8543	0.2707		

Exe_Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		2.1810	2.0160	2.3459	0.8524	0.7506	0.9863
1		2.1818	1.5947	2.7689	0.8739	0.6106	1.5336
Diff (1-2)	Pooled	-0.00087	-0.5372	0.5355	0.8543	0.7563	0.9816
Diff (1-2)	Satterthwaite	-0.00087	-0.6024	0.6007			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-0.00	0.9975
Satterthwaite	Unequal	12.081	-0.00	0.9976

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Variable: a_Mod_scalable

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	10	104	1.05	0.8138

Variable: b_One_stop_shop

Exe_Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	105	1.8381	1.0481	0.1023	0	3.0000
1	11	1.7273	0.9045	0.2727	0	3.0000
Diff (1-2)		0.1108	1.0363	0.3284		

Exe_Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.8381	1.6353	2.0409	1.0481	0.9230	1.2128
1		1.7273	1.1196	2.3349	0.9045	0.6320	1.5874
Diff (1-2)	Pooled	0.1108	-0.5398	0.7614	1.0363	0.9175	1.1908
Diff (1-2)	Satterthwaite	0.1108	-0.5185	0.7402			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.34	0.7364
Satterthwaite	Unequal	12.986	0.38	0.7097

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	104	10	1.34	0.6383

Variable: c_Lean_org

Exe_Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	105	1.5714	0.9078	0.0886	0	3.0000
1	11	1.8182	1.0787	0.3252	0	3.0000
Diff (1-2)		-0.2468	0.9241	0.2929		

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Variable: c_Lean_org

Exe_Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.5714	1.3957	1.7471	0.9078	0.7995	1.0505
1		1.8182	1.0935	2.5429	1.0787	0.7537	1.8931
Diff (1-2)	Pooled	-0.2468	-0.8269	0.3334	0.9241	0.8181	1.0618
Diff (1-2)	Satterthwaite	-0.2468	-0.9845	0.4910			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-0.84	0.4012
Satterthwaite	Unequal	11.533	-0.73	0.4788

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	10	104	1.41	0.3705

Variable: d_Max_cont_mono

Exe_Oper	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	105	0.4095	0.7807	0.0762	0	3.0000
1	11	0.2727	0.6467	0.1950	0	2.0000
Diff (1-2)		0.1368	0.7699	0.2440		

Exe_Oper	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.4095	0.2584	0.5606	0.7807	0.6875	0.9034
1		0.2727	-0.1617	0.7072	0.6467	0.4518	1.1349
Diff (1-2)	Pooled	0.1368	-0.3465	0.6201	0.7699	0.6816	0.8847
Diff (1-2)	Satterthwaite	0.1368	-0.3146	0.5881			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.56	0.5761
Satterthwaite	Unequal	13.257	0.65	0.5246

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	104	10	1.46	0.5295

Background Bias: North America t-test

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                               Variable:  a_Existing_rel

       NAmer          N        Mean     Std Dev     Std Err     Minimum     Maximum

       0             66      1.8788      1.1165      0.1374           0      3.0000
       1             50      2.0600      1.0768      0.1523           0      3.0000
       Diff (1-2)           -0.1812      1.0996      0.2062

   NAmer         Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

   0                               1.8788      1.6043   2.1533      1.1165      0.9532   1.3479
   1                               2.0600      1.7540   2.3660      1.0768      0.8995   1.3419
   Diff (1-2)    Pooled           -0.1812     -0.5896   0.2272      1.0996      0.9736   1.2635
   Diff (1-2)    Satterthwaite    -0.1812     -0.5878   0.2254

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.88      0.3813
                 Satterthwaite    Unequal      107.54      -0.88      0.3790

                                Equality of Variances

                    Method      Num DF    Den DF    F Value    Pr > F

                    Folded F        65        49       1.08    0.7978
```

```
                               Variable:  b_Own_phys_net

       NAmer          N        Mean     Std Dev     Std Err     Minimum     Maximum

       0             66      1.4242      0.9932      0.1223           0      3.0000
       1             50      1.2400      1.1350      0.1605           0      3.0000
       Diff (1-2)            0.1842      1.0565      0.1981

   NAmer         Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

   0                               1.4242      1.1801   1.6684      0.9932      0.8480   1.1990
   1                               1.2400      0.9174   1.5626      1.1350      0.9481   1.4143
   Diff (1-2)    Pooled            0.1842     -0.2081   0.5766      1.0565      0.9353   1.2140
   Diff (1-2)    Satterthwaite     0.1842     -0.2162   0.5847

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.93      0.3543
                 Satterthwaite    Unequal      97.587       0.91      0.3634

                                Equality of Variances

                    Method      Num DF    Den DF    F Value    Pr > F

                    Folded F        49        65       1.31    0.3124
```

```
                                  Variable:  c_Fin_str

       NAmer          N        Mean     Std Dev     Std Err     Minimum     Maximum

       0             66      1.6364      1.0021      0.1233           0      3.0000
       1             50      1.4000      1.0302      0.1457           0      3.0000
       Diff (1-2)            0.2364      1.0143      0.1902

   NAmer         Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

   0                               1.6364      1.3900   1.8827      1.0021      0.8555   1.2097
   1                               1.4000      1.1072   1.6928      1.0302      0.8605   1.2837
   Diff (1-2)    Pooled            0.2364     -0.1403   0.6131      1.0143      0.8980   1.1654
   Diff (1-2)    Satterthwaite     0.2364     -0.1422   0.6149

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       1.24      0.2164
                 Satterthwaite    Unequal       104.1       1.24      0.2184
```

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	49	65	1.06	0.8272

Variable: d_Reput_exp

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	1.0606	1.2138	0.1494	0	3.0000
1	50	1.3000	1.0738	0.1519	0	3.0000
Diff (1-2)		-0.2394	1.1557	0.2167		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.0606	0.7622	1.3590	1.2138	1.0362	1.4652
1		1.3000	0.9948	1.6052	1.0738	0.8970	1.3381
Diff (1-2)	Pooled	-0.2394	-0.6686	0.1898	1.1557	1.0232	1.3279
Diff (1-2)	Satterthwaite	-0.2394	-0.6615	0.1827			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-1.10	0.2716
Satterthwaite	Unequal	111.22	-1.12	0.2635

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	65	49	1.28	0.3719

Variable: a_Outdated_net

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	1.6212	1.0636	0.1309	0	3.0000
1	50	1.6600	1.0422	0.1474	0	3.0000
Diff (1-2)		-0.0388	1.0544	0.1977		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.6212	1.3597	1.8827	1.0636	0.9080	1.2840
1		1.6600	1.3638	1.9562	1.0422	0.8706	1.2987
Diff (1-2)	Pooled	-0.0388	-0.4304	0.3528	1.0544	0.9335	1.2116
Diff (1-2)	Satterthwaite	-0.0388	-0.4296	0.3520			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-0.20	0.8448
Satterthwaite	Unequal	106.74	-0.20	0.8444

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	65	49	1.04	0.8897

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Variable: b_Low_serv_qual

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	2.2879	0.8904	0.1096	0	3.0000
1	50	1.9600	1.1945	0.1689	0	3.0000
Diff (1-2)		0.3279	1.0322	0.1935		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		2.2879	2.0690	2.5068	0.8904	0.7602	1.0749
1		1.9600	1.6205	2.2995	1.1945	0.9978	1.4886
Diff (1-2)	Pooled	0.3279	-0.0555	0.7112	1.0322	0.9138	1.1860
Diff (1-2)	Satterthwaite	0.3279	-0.0724	0.7281			

Method	Variances	DF	t Value	Pr > |t|

Pooled	Equal	114	1.69	0.0929
Satterthwaite	Unequal	87.273	1.63	0.1071

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	49	65	1.80	0.0268

Variable: c_Expen_telec

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	1.0152	0.8502	0.1047	0	3.0000
1	50	1.0000	1.0690	0.1512	0	3.0000
Diff (1-2)		0.0152	0.9505	0.1782		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.0152	0.8061	1.2242	0.8502	0.7259	1.0264
1		1.0000	0.6962	1.3038	1.0690	0.8930	1.3322
Diff (1-2)	Pooled	0.0152	-0.3379	0.3682	0.9505	0.8415	1.0921
Diff (1-2)	Satterthwaite	0.0152	-0.3501	0.3804			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.09	0.9324
Satterthwaite	Unequal	91.39	0.08	0.9345

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	49	65	1.58	0.0840

Variable: d_Limit_rigid

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	1.0758	1.1676	0.1437	0	3.0000
1	50	1.3800	0.9666	0.1367	0	3.0000
Diff (1-2)		-0.3042	1.0858	0.2036		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.0758	0.7887	1.3628	1.1676	0.9969	1.4096
1		1.3800	1.1053	1.6547	0.9666	0.8074	1.2045
Diff (1-2)	Pooled	-0.3042	-0.7075	0.0990	1.0858	0.9613	1.2476
Diff (1-2)	Satterthwaite	-0.3042	-0.6972	0.0887			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-1.49	0.1378
Satterthwaite	Unequal	113.06	-1.53	0.1279

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	65	49	1.46	0.1683

Variable: a_Oth_telcos_attack

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	1.9545	0.8670	0.1067	0	3.0000
1	50	1.3800	0.9666	0.1367	0	3.0000
Diff (1-2)		0.5745	0.9112	0.1708		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.9545	1.7414	2.1677	0.8670	0.7402	1.0467
1		1.3800	1.1053	1.6547	0.9666	0.8074	1.2045
Diff (1-2)	Pooled	0.5745	0.2361	0.9130	0.9112	0.8067	1.0470
Diff (1-2)	Satterthwaite	0.5745	0.2304	0.9186			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	3.36	0.0010
Satterthwaite	Unequal	99.167	3.31	0.0013

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                              Equality of Variances

                 Method      Num DF    Den DF    F Value    Pr > F

                 Folded F        49        65       1.24    0.4095
```

```
                           Variable:  b_Cable_Sat_Wire

         NAmer           N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              66      1.9242      0.8825      0.1086           0      3.0000
         1              50      2.2200      0.7900      0.1117      1.0000      3.0000
         Diff (1-2)            -0.2958      0.8440      0.1582

 NAmer         Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                                1.9242      1.7073   2.1412      0.8825      0.7534   1.0653
 1                                2.2200      1.9955   2.4445      0.7900      0.6599   0.9844
 Diff (1-2)    Pooled            -0.2958     -0.6092   0.0177      0.8440      0.7472   0.9698
 Diff (1-2)    Satterthwaite     -0.2958     -0.6045   0.0130

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -1.87      0.0642
                 Satterthwaite    Unequal      110.79      -1.90      0.0603

                              Equality of Variances

                 Method      Num DF    Den DF    F Value    Pr > F

                 Folded F        65        49       1.25    0.4200
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                           Variable:  c_Equip_vend_sys

         NAmer           N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              66      0.4848      0.7069      0.0870           0      3.0000
         1              50      0.5200      0.7887      0.1115           0      3.0000
         Diff (1-2)            -0.0352      0.7432      0.1393

 NAmer         Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                                0.4848      0.3111   0.6586      0.7069      0.6036   0.8534
 1                                0.5200      0.2959   0.7441      0.7887      0.6588   0.9828
 Diff (1-2)    Pooled            -0.0352     -0.3112   0.2409      0.7432      0.6580   0.8540
 Diff (1-2)    Satterthwaite     -0.0352     -0.3158   0.2455

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.25      0.8013
                 Satterthwaite    Unequal       99.12      -0.25      0.8043

                              Equality of Variances

                 Method      Num DF    Den DF    F Value    Pr > F

                 Folded F        49        65       1.24    0.4064
```

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                           Variable:  d_Co_understa

         NAmer           N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              66      1.6364      1.2605      0.1552           0      3.0000
         1              50      1.8800      1.1183      0.1582           0      3.0000
         Diff (1-2)            -0.2436      1.2014      0.2253

 NAmer         Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                                1.6364      1.3265   1.9462      1.2605      1.0761   1.5216
 1                                1.8800      1.5622   2.1978      1.1183      0.9342   1.3936
 Diff (1-2)    Pooled            -0.2436     -0.6899   0.2026      1.2014      1.0637   1.3805
 Diff (1-2)    Satterthwaite     -0.2436     -0.6827   0.1954

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -1.08      0.2817
                 Satterthwaite    Unequal      111.12      -1.10      0.2738
```

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	65	49	1.27	0.3831

Variable: a_Bus_serv_cloud

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	2.2576	0.9167	0.1128	0	3.0000
1	50	2.3000	0.8631	0.1221	0	3.0000
Diff (1-2)		-0.0424	0.8940	0.1676		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		2.2576	2.0322	2.4829	0.9167	0.7826	1.1066
1		2.3000	2.0547	2.5453	0.8631	0.7210	1.0755
Diff (1-2)	Pooled	-0.0424	-0.3745	0.2896	0.8940	0.7915	1.0273
Diff (1-2)	Satterthwaite	-0.0424	-0.3719	0.2870			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-0.25	0.8007
Satterthwaite	Unequal	108.7	-0.26	0.7990

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	65	49	1.13	0.6638

Variable: b_Ultra_speed_Inter

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	1.2576	1.0423	0.1283	0	3.0000
1	50	1.3000	1.0351	0.1464	0	3.0000
Diff (1-2)		-0.0424	1.0392	0.1948		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.2576	1.0013	1.5138	1.0423	0.8899	1.2583
1		1.3000	1.0058	1.5942	1.0351	0.8647	1.2899
Diff (1-2)	Pooled	-0.0424	-0.4284	0.3436	1.0392	0.9201	1.1941
Diff (1-2)	Satterthwaite	-0.0424	-0.4283	0.3435			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-0.22	0.8280
Satterthwaite	Unequal	106.03	-0.22	0.8279

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	65	49	1.01	0.9686

Variable: c_New_revenues

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	1.7879	0.9690	0.1193	0	3.0000
1	50	1.6800	0.9781	0.1383	0	3.0000
Diff (1-2)		0.1079	0.9729	0.1824		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.7879	1.5497	2.0261	0.9690	0.8273	1.1697
1		1.6800	1.4020	1.9580	0.9781	0.8171	1.2189
Diff (1-2)	Pooled	0.1079	-0.2535	0.4692	0.9729	0.8614	1.1179
Diff (1-2)	Satterthwaite	0.1079	-0.2543	0.4700			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.59	0.5554
Satterthwaite	Unequal	105.14	0.59	0.5560

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F

Method	Num DF	Den DF	F Value	Pr > F
Folded F	49	65	1.02	0.9343

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Variable: d_Smart_home_sol

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	0.6970	0.9110	0.1121	0	3.0000
1	50	0.7200	0.9906	0.1401	0	3.0000
Diff (1-2)		-0.0230	0.9460	0.1774		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.6970	0.4730	0.9209	0.9110	0.7777	1.0997
1		0.7200	0.4385	1.0015	0.9906	0.8275	1.2344
Diff (1-2)	Pooled	-0.0230	-0.3744	0.3283	0.9460	0.8375	1.0870
Diff (1-2)	Satterthwaite	-0.0230	-0.3790	0.3329			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-0.13	0.8969
Satterthwaite	Unequal	100.73	-0.13	0.8981

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	49	65	1.18	0.5234

Variable: a_Invest_net

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	1.7879	1.2343	0.1519	0	3.0000
1	50	2.0200	1.0971	0.1552	0	3.0000
Diff (1-2)		-0.2321	1.1773	0.2207		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.7879	1.4844	2.0913	1.2343	1.0538	1.4901
1		2.0200	1.7082	2.3318	1.0971	0.9165	1.3672
Diff (1-2)	Pooled	-0.2321	-0.6694	0.2051	1.1773	1.0423	1.3528
Diff (1-2)	Satterthwaite	-0.2321	-0.6624	0.1982			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-1.05	0.2952
Satterthwaite	Unequal	111.05	-1.07	0.2874

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	65	49	1.27	0.3906

Variable: b_Use_billing_rel

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	1.1818	1.1219	0.1381	0	3.0000
1	50	0.8800	1.0029	0.1418	0	3.0000
Diff (1-2)		0.3018	1.0724	0.2011		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.1818	0.9060	1.4576	1.1219	0.9579	1.3544
1		0.8800	0.5950	1.1650	1.0029	0.8377	1.2497
Diff (1-2)	Pooled	0.3018	-0.0965	0.7001	1.0724	0.9494	1.2322
Diff (1-2)	Satterthwaite	0.3018	-0.0904	0.6941			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	1.50	0.1361
Satterthwaite	Unequal	110.85	1.52	0.1302

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	65	49	1.25	0.4137

Variable: c_Gen_rev_Wholes

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	1.3182	0.9308	0.1146	0	3.0000
1	50	1.1600	0.9116	0.1289	0	3.0000
Diff (1-2)		0.1582	0.9226	0.1730		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.3182	1.0894	1.5470	0.9308	0.7947	1.1237
1		1.1600	0.9009	1.4191	0.9116	0.7615	1.1360
Diff (1-2)	Pooled	0.1582	-0.1845	0.5008	0.9226	0.8168	1.0601
Diff (1-2)	Satterthwaite	0.1582	-0.1837	0.5001			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.91	0.3624
Satterthwaite	Unequal	106.76	0.92	0.3611

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	65	49	1.04	0.8866

Variable: d_Converge_net_serv

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	1.7121	1.0780	0.1327	0	3.0000
1	50	1.9400	1.0382	0.1468	0	3.0000
Diff (1-2)		-0.2279	1.0611	0.1989		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.7121	1.4471	1.9771	1.0780	0.9203	1.3013
1		1.9400	1.6449	2.2351	1.0382	0.8673	1.2938
Diff (1-2)	Pooled	-0.2279	-0.6220	0.1662	1.0611	0.9394	1.2192
Diff (1-2)	Satterthwaite	-0.2279	-0.6202	0.1644			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-1.15	0.2544
Satterthwaite	Unequal	107.61	-1.15	0.2521

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	65	49	1.08	0.7900

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Variable: a_Access_Net

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	1.9091	1.0916	0.1344	0	3.0000
1	50	2.1000	1.1112	0.1571	0	3.0000
Diff (1-2)		-0.1909	1.1001	0.2062		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.9091	1.6407	2.1774	1.0916	0.9320	1.3178
1		2.1000	1.7842	2.4158	1.1112	0.9282	1.3847
Diff (1-2)	Pooled	-0.1909	-0.5995	0.2177	1.1001	0.9739	1.2640
Diff (1-2)	Satterthwaite	-0.1909	-0.6009	0.2191			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-0.93	0.3566
Satterthwaite	Unequal	104.67	-0.92	0.3579

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	49	65	1.04	0.8848

Variable: b_Core_Net

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	1.2424	1.0086	0.1241	0	3.0000
1	50	1.5600	1.0529	0.1489	0	3.0000
Diff (1-2)		-0.3176	1.0279	0.1927		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.2424	0.9945	1.4904	1.0086	0.8611	1.2176
1		1.5600	1.2608	1.8592	1.0529	0.8795	1.3120
Diff (1-2)	Pooled	-0.3176	-0.6993	0.0642	1.0279	0.9100	1.1811
Diff (1-2)	Satterthwaite	-0.3176	-0.7021	0.0669			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-1.65	0.1021
Satterthwaite	Unequal	103.21	-1.64	0.1044

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	49	65	1.09	0.7391

Variable: c_Service_Apps

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	1.9697	1.0373	0.1277	0	3.0000
1	50	1.6600	0.9607	0.1359	0	3.0000
Diff (1-2)		0.3097	1.0051	0.1884		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.9697	1.7147	2.2247	1.0373	0.8856	1.2522
1		1.6600	1.3870	1.9330	0.9607	0.8025	1.1971
Diff (1-2)	Pooled	0.3097	-0.0636	0.6830	1.0051	0.8898	1.1549
Diff (1-2)	Satterthwaite	0.3097	-0.0598	0.6792			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	1.64	0.1030
Satterthwaite	Unequal	109.43	1.66	0.0996

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	65	49	1.17	0.5779

Variable: d_QoS_monitor

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	0.8788	0.9690	0.1193	0	3.0000
1	50	0.6800	0.8676	0.1227	0	3.0000
Diff (1-2)		0.1988	0.9267	0.1738		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.8788	0.6406	1.1170	0.9690	0.8273	1.1697
1		0.6800	0.4334	0.9266	0.8676	0.7247	1.0811
Diff (1-2)	Pooled	0.1988	-0.1454	0.5430	0.9267	0.8205	1.0649
Diff (1-2)	Satterthwaite	0.1988	-0.1403	0.5379			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	1.14	0.2550
Satterthwaite	Unequal	110.79	1.16	0.2478

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	65	49	1.25	0.4207

Variable: a_Strategic_collab

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	1.6970	1.0373	0.1277	0	3.0000
1	50	1.3600	0.9205	0.1302	0	3.0000
Diff (1-2)		0.3370	0.9888	0.1854		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.6970	1.4420	1.9520	1.0373	0.8856	1.2522
1		1.3600	1.0984	1.6216	0.9205	0.7689	1.1471
Diff (1-2)	Pooled	0.3370	-0.0303	0.7042	0.9888	0.8754	1.1362
Diff (1-2)	Satterthwaite	0.3370	-0.0244	0.6983			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	1.82	0.0717
Satterthwaite	Unequal	111.11	1.85	0.0673

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	65	49	1.27	0.3841

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Variable: b_Effective_regul

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	0.9394	1.1077	0.1364	0	3.0000
1	50	0.6200	0.9452	0.1337	0	3.0000
Diff (1-2)		0.3194	1.0410	0.1952		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.9394	0.6671	1.2117	1.1077	0.9457	1.3372
1		0.6200	0.3514	0.8886	0.9452	0.7896	1.1779
Diff (1-2)	Pooled	0.3194	-0.0672	0.7060	1.0410	0.9216	1.1962
Diff (1-2)	Satterthwaite	0.3194	-0.0589	0.6977			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	1.64	0.1045
Satterthwaite	Unequal	112.33	1.67	0.0972

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	65	49	1.37	0.2473

Variable: c_Cont_invest

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	1.9242	0.9971	0.1227	0	3.0000
1	50	2.2800	0.8581	0.1214	0	3.0000
Diff (1-2)		-0.3558	0.9399	0.1762		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.9242	1.6791	2.1694	0.9971	0.8513	1.2037
1		2.2800	2.0361	2.5239	0.8581	0.7168	1.0693
Diff (1-2)	Pooled	-0.3558	-0.7048	-0.00668	0.9399	0.8321	1.0800
Diff (1-2)	Satterthwaite	-0.3558	-0.6977	-0.0138			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-2.02	0.0458
Satterthwaite	Unequal	112.1	-2.06	0.0416

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	65	49	1.35	0.2736

Variable: d_Bundling_serv

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	1.4394	1.1112	0.1368	0	3.0000
1	50	1.7400	1.0654	0.1507	0	3.0000
Diff (1-2)		-0.3006	1.0917	0.2047		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.4394	1.1662	1.7126	1.1112	0.9487	1.3414
1		1.7400	1.4372	2.0428	1.0654	0.8900	1.3276
Diff (1-2)	Pooled	-0.3006	-0.7061	0.1049	1.0917	0.9666	1.2545
Diff (1-2)	Satterthwaite	-0.3006	-0.7040	0.1028			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-1.47	0.1447
Satterthwaite	Unequal	107.83	-1.48	0.1425

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	65	49	1.09	0.7643

Variable: a_Sys_vend_integ

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	1.4848	1.1265	0.1387	0	3.0000
1	50	1.3800	1.1409	0.1613	0	3.0000
Diff (1-2)		0.1048	1.1327	0.2124		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.4848	1.2079	1.7618	1.1265	0.9617	1.3599
1		1.3800	1.0558	1.7042	1.1409	0.9530	1.4217
Diff (1-2)	Pooled	0.1048	-0.3159	0.5255	1.1327	1.0028	1.3015
Diff (1-2)	Satterthwaite	0.1048	-0.3170	0.5267			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.49	0.6225
Satterthwaite	Unequal	104.95	0.49	0.6232

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	49	65	1.03	0.9147

Variable: b_Oth_oper_wholesale

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	1.1061	1.0688	0.1316	0	3.0000
1	50	1.0200	0.9581	0.1355	0	3.0000
Diff (1-2)		0.0861	1.0227	0.1917		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.1061	0.8433	1.3688	1.0688	0.9125	1.2903
1		1.0200	0.7477	1.2923	0.9581	0.8003	1.1939
Diff (1-2)	Pooled	0.0861	-0.2938	0.4659	1.0227	0.9054	1.1752
Diff (1-2)	Satterthwaite	0.0861	-0.2882	0.4603			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.45	0.6544
Satterthwaite	Unequal	110.74	0.46	0.6495

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	65	49	1.24	0.4257

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Variable: c_Cont_provid

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	2.0000	0.9446	0.1163	0	3.0000
1	50	2.0000	0.9897	0.1400	0	3.0000

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
Diff (1-2)		0	0.9643	0.1808		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		2.0000	1.7678	2.2322	0.9446	0.8065	1.1403
1		2.0000	1.7187	2.2813	0.9897	0.8268	1.2334
Diff (1-2)	Pooled	0	-0.3581	0.3581	0.9643	0.8537	1.1080
Diff (1-2)	Satterthwaite	0	-0.3609	0.3609			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.00	1.0000
Satterthwaite	Unequal	102.99	0.00	1.0000

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	49	65	1.10	0.7185

Variable: d_Net_co_Skype

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	1.4091	1.1632	0.1432	0	3.0000
1	50	1.6000	1.1780	0.1666	0	3.0000
Diff (1-2)		-0.1909	1.1696	0.2193		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.4091	1.1231	1.6951	1.1632	0.9931	1.4043
1		1.6000	1.2652	1.9348	1.1780	0.9840	1.4680
Diff (1-2)	Pooled	-0.1909	-0.6253	0.2435	1.1696	1.0355	1.3440
Diff (1-2)	Satterthwaite	-0.1909	-0.6265	0.2447			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-0.87	0.3858
Satterthwaite	Unequal	104.96	-0.87	0.3868

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	49	65	1.03	0.9151

Variable: a_Int_resist

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	1.7424	0.9815	0.1208	0	3.0000
1	50	1.6200	1.1229	0.1588	0	3.0000
Diff (1-2)		0.1224	1.0446	0.1959		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.7424	1.5011	1.9837	0.9815	0.8380	1.1849
1		1.6200	1.3009	1.9391	1.1229	0.9380	1.3992
Diff (1-2)	Pooled	0.1224	-0.2656	0.5104	1.0446	0.9248	1.2003
Diff (1-2)	Satterthwaite	0.1224	-0.2736	0.5184			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.63	0.5332
Satterthwaite	Unequal	97.516	0.61	0.5409

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	49	65	1.31	0.3084

Variable: b_Out_date_bus

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	2.3333	0.9001	0.1108	0	3.0000
1	50	2.2800	0.8816	0.1247	0	3.0000
Diff (1-2)		0.0533	0.8922	0.1673		

```
NAmer         Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                2.3333      2.1121   2.5546      0.9001      0.7685   1.0866
1                                2.2800      2.0295   2.5305      0.8816      0.7364   1.0985
Diff (1-2)    Pooled             0.0533     -0.2780   0.3847      0.8922      0.7899   1.0252
Diff (1-2)    Satterthwaite      0.0533     -0.2773   0.3840

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.32      0.7504
                 Satterthwaite    Unequal      106.76       0.32      0.7498

                                    Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        65        49       1.04    0.8866
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                                  Variable:  c_Erod_profit

        NAmer           N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              66      1.1061      0.9628      0.1185           0      3.0000
        1              50      1.4200      0.9916      0.1402           0      3.0000
        Diff (1-2)            -0.3139      0.9753      0.1829

NAmer         Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.1061      0.8694   1.3428      0.9628      0.8220   1.1623
1                                1.4200      1.1382   1.7018      0.9916      0.8283   1.2357
Diff (1-2)    Pooled            -0.3139     -0.6762   0.0483      0.9753      0.8635   1.1207
Diff (1-2)    Satterthwaite     -0.3139     -0.6780   0.0502

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -1.72      0.0887
                 Satterthwaite    Unequal         104      -1.71      0.0903

                                    Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        49        65       1.06    0.8166
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                                   Variable:  d_Much_reg

        NAmer           N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              66      0.8182      0.9909      0.1220           0      3.0000
        1              50      0.6800      0.8676      0.1227           0      3.0000
        Diff (1-2)             0.1382      0.9398      0.1762

NAmer         Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                0.8182      0.5746   1.0618      0.9909      0.8460   1.1962
1                                0.6800      0.4334   0.9266      0.8676      0.7247   1.0811
Diff (1-2)    Pooled             0.1382     -0.2109   0.4873      0.9398      0.8321   1.0799
Diff (1-2)    Satterthwaite      0.1382     -0.2046   0.4810

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.78      0.4346
                 Satterthwaite    Unequal      111.57       0.80      0.4261

                                    Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        65        49       1.30    0.3325
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                                 Variable:  a_Mod_scalable

        NAmer           N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              66      2.1970      0.8269      0.1018      1.0000      3.0000
        1              50      2.1600      0.8889      0.1257           0      3.0000
        Diff (1-2)             0.0370      0.8541      0.1601

NAmer         Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev
```

0		2.1970	1.9937	2.4002	0.8269	0.7059	0.9982
1		2.1600	1.9074	2.4126	0.8889	0.7426	1.1077
Diff (1-2)	Pooled	0.0370	-0.2802	0.3542	0.8541	0.7562	0.9814
Diff (1-2)	Satterthwaite	0.0370	-0.2839	0.3578			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.23	0.8178
Satterthwaite	Unequal	101.43	0.23	0.8197

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	49	65	1.16	0.5803

Variable: b_One_stop_shop

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	1.9242	0.9971	0.1227	0	3.0000
1	50	1.7000	1.0738	0.1519	0	3.0000
Diff (1-2)		0.2242	1.0308	0.1933		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.9242	1.6791	2.1694	0.9971	0.8513	1.2037
1		1.7000	1.3948	2.0052	1.0738	0.8970	1.3381
Diff (1-2)	Pooled	0.2242	-0.1586	0.6071	1.0308	0.9126	1.1844
Diff (1-2)	Satterthwaite	0.2242	-0.1631	0.6116			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	1.16	0.2483
Satterthwaite	Unequal	101.33	1.15	0.2535

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	49	65	1.16	0.5714

Variable: c_Lean_org

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	1.5303	0.9152	0.1126	0	3.0000
1	50	1.6800	0.9355	0.1323	0	3.0000
Diff (1-2)		-0.1497	0.9239	0.1732		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.5303	1.3053	1.7553	0.9152	0.7813	1.1048
1		1.6800	1.4141	1.9459	0.9355	0.7814	1.1657
Diff (1-2)	Pooled	-0.1497	-0.4929	0.1935	0.9239	0.8180	1.0617
Diff (1-2)	Satterthwaite	-0.1497	-0.4942	0.1949			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-0.86	0.3893
Satterthwaite	Unequal	104.43	-0.86	0.3909

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	49	65	1.04	0.8603

Variable: d_Max_cont_mono

NAmer	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	66	0.3485	0.7336	0.0903	0	3.0000
1	50	0.4600	0.8134	0.1150	0	3.0000
Diff (1-2)		-0.1115	0.7689	0.1442		

NAmer	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.3485	0.1681	0.5288	0.7336	0.6263	0.8856
1		0.4600	0.2288	0.6912	0.8134	0.6795	1.0136
Diff (1-2)	Pooled	-0.1115	-0.3971	0.1741	0.7689	0.6808	0.8836
Diff (1-2)	Satterthwaite	-0.1115	-0.4017	0.1786			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-0.77	0.4408
Satterthwaite	Unequal	99.514	-0.76	0.4476

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	49	65	1.23	0.4332

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Variable: a_Existing_rel

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	1.8571	1.1311	0.1186	0	3.0000
1	25	2.3200	0.9000	0.1800	0	3.0000
Diff (1-2)		-0.4629	1.0865	0.2453		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.8571	1.6216	2.0927	1.1311	0.9873	1.3244
1		2.3200	1.9485	2.6915	0.9000	0.7027	1.2520
Diff (1-2)	Pooled	-0.4629	-0.9489	0.0232	1.0865	0.9619	1.2485
Diff (1-2)	Satterthwaite	-0.4629	-0.8965	-0.0292			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-1.89	0.0618
Satterthwaite	Unequal	46.988	-2.15	0.0370

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	90	24	1.58	0.2026

Variable: b_Own_phys_net

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	1.3516	1.0685	0.1120	0	3.0000
1	25	1.3200	1.0296	0.2059	0	3.0000
Diff (1-2)		0.0316	1.0604	0.2394		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.3516	1.1291	1.5742	1.0685	0.9326	1.2511
1		1.3200	0.8950	1.7450	1.0296	0.8039	1.4323
Diff (1-2)	Pooled	0.0316	-0.4427	0.5060	1.0604	0.9388	1.2185
Diff (1-2)	Satterthwaite	0.0316	-0.4423	0.5056			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.13	0.8951
Satterthwaite	Unequal	39.384	0.14	0.8933

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	90	24	1.08	0.8708

Variable: c_Fin_str

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	1.5604	1.0563	0.1107	0	3.0000
1	25	1.4400	0.8699	0.1740	0	3.0000
Diff (1-2)		0.1204	1.0199	0.2303		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.5604	1.3405	1.7804	1.0563	0.9220	1.2368
1		1.4400	1.0809	1.7991	0.8699	0.6792	1.2101
Diff (1-2)	Pooled	0.1204	-0.3358	0.5767	1.0199	0.9029	1.1719
Diff (1-2)	Satterthwaite	0.1204	-0.2948	0.5357			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.52	0.6020
Satterthwaite	Unequal	45.397	0.58	0.5621

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F

Method	Num DF	Den DF	F Value	Pr > F
Folded F	90	24	1.47	0.2797

Variable: d_Reput_exp

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	1.2308	1.1360	0.1191	0	3.0000
1	25	0.9200	1.2220	0.2444	0	3.0000
Diff (1-2)		0.3108	1.1547	0.2607		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.2308	0.9942	1.4674	1.1360	0.9916	1.3302
1		0.9200	0.4156	1.4244	1.2220	0.9542	1.7000
Diff (1-2)	Pooled	0.3108	-0.2057	0.8273	1.1547	1.0223	1.3268
Diff (1-2)	Satterthwaite	0.3108	-0.2405	0.8620			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	1.19	0.2358
Satterthwaite	Unequal	36.205	1.14	0.2605

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	24	90	1.16	0.6060

Variable: a_Outdated_net

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	1.6484	1.0891	0.1142	0	3.0000
1	25	1.6000	0.9129	0.1826	0	3.0000
Diff (1-2)		0.0484	1.0544	0.2381		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.6484	1.4215	1.8752	1.0891	0.9506	1.2752
1		1.6000	1.2232	1.9768	0.9129	0.7128	1.2699
Diff (1-2)	Pooled	0.0484	-0.4233	0.5200	1.0544	0.9335	1.2116
Diff (1-2)	Satterthwaite	0.0484	-0.3854	0.4822			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.20	0.8394
Satterthwaite	Unequal	44.619	0.22	0.8234

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	90	24	1.42	0.3268

Variable: b_Low_serv_qual

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	2.0769	1.0670	0.1119	0	3.0000
1	25	2.4000	0.9129	0.1826	0	3.0000
Diff (1-2)		-0.3231	1.0364	0.2340		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		2.0769	1.8547	2.2991	1.0670	0.9313	1.2493
1		2.4000	2.0232	2.7768	0.9129	0.7128	1.2699
Diff (1-2)	Pooled	-0.3231	-0.7867	0.1405	1.0364	0.9176	1.1909
Diff (1-2)	Satterthwaite	-0.3231	-0.7547	0.1085			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-1.38	0.1701
Satterthwaite	Unequal	43.752	-1.51	0.1385

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	90	24	1.37	0.3880

Variable: c_Expen_telec

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	1.0440	0.9651	0.1012	0	3.0000
1	25	0.8800	0.8813	0.1763	0	3.0000
Diff (1-2)		0.1640	0.9481	0.2141		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.0440	0.8430	1.2449	0.9651	0.8424	1.1300
1		0.8800	0.5162	1.2438	0.8813	0.6881	1.2260
Diff (1-2)	Pooled	0.1640	-0.2601	0.5880	0.9481	0.8393	1.0894
Diff (1-2)	Satterthwaite	0.1640	-0.2464	0.5743			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.77	0.4453
Satterthwaite	Unequal	41.225	0.81	0.4244

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	90	24	1.20	0.6288

Variable: d_Limit_rigid

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	1.2308	1.0758	0.1128	0	3.0000
1	25	1.1200	1.1662	0.2332	0	3.0000
Diff (1-2)		0.1108	1.0954	0.2474		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.2308	1.0067	1.4548	1.0758	0.9390	1.2596
1		1.1200	0.6386	1.6014	1.1662	0.9106	1.6223
Diff (1-2)	Pooled	0.1108	-0.3792	0.6008	1.0954	0.9698	1.2587
Diff (1-2)	Satterthwaite	0.1108	-0.4146	0.6362			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.45	0.6551
Satterthwaite	Unequal	36.008	0.43	0.6715

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	24	90	1.18	0.5723

Variable: a_Oth_telcos_attack

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	1.6593	0.9571	0.1003	0	3.0000
1	25	1.8800	0.9274	0.1855	0	3.0000
Diff (1-2)		-0.2207	0.9509	0.2147		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.6593	1.4600	1.8587	0.9571	0.8354	1.1206
1		1.8800	1.4972	2.2628	0.9274	0.7241	1.2901
Diff (1-2)	Pooled	-0.2207	-0.6460	0.2047	0.9509	0.8419	1.0926
Diff (1-2)	Satterthwaite	-0.2207	-0.6471	0.2058			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-1.03	0.3063
Satterthwaite	Unequal	39.205	-1.05	0.3018

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	90	24	1.07	0.8973

Variable: b_Cable_Sat_Wire

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	2.0879	0.8647	0.0906	0	3.0000
1	25	1.9200	0.8124	0.1625	0	3.0000
Diff (1-2)		0.1679	0.8540	0.1928		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		2.0879	1.9078	2.2680	0.8647	0.7548	1.0125
1		1.9200	1.5847	2.2553	0.8124	0.6343	1.1302
Diff (1-2)	Pooled	0.1679	-0.2141	0.5499	0.8540	0.7561	0.9813
Diff (1-2)	Satterthwaite	0.1679	-0.2081	0.5439			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.87	0.3857
Satterthwaite	Unequal	40.226	0.90	0.3722

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	90	24	1.13	0.7531

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Variable: c_Equip_vend_sys

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	0.5275	0.7795	0.0817	0	3.0000
1	25	0.4000	0.5774	0.1155	0	2.0000
Diff (1-2)		0.1275	0.7415	0.1674		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.5275	0.3651	0.6898	0.7795	0.6803	0.9127
1		0.4000	0.1617	0.6383	0.5774	0.4508	0.8032
Diff (1-2)	Pooled	0.1275	-0.2042	0.4592	0.7415	0.6565	0.8520
Diff (1-2)	Satterthwaite	0.1275	-0.1566	0.4115			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.76	0.4480
Satterthwaite	Unequal	50.666	0.90	0.3718

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	90	24	1.82	0.0954

Variable: d_Co_understa

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	1.7253	1.1838	0.1241	0	3.0000
1	25	1.8000	1.2910	0.2582	0	3.0000
Diff (1-2)		-0.0747	1.2072	0.2726		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.7253	1.4787	1.9718	1.1838	1.0333	1.3861
1		1.8000	1.2671	2.3329	1.2910	1.0080	1.7960
Diff (1-2)	Pooled	-0.0747	-0.6147	0.4653	1.2072	1.0688	1.3871
Diff (1-2)	Satterthwaite	-0.0747	-0.6558	0.5064			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-0.27	0.7845
Satterthwaite	Unequal	35.859	-0.26	0.7957

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	24	90	1.19	0.5470

Variable: a_Bus_serv_cloud

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	2.2967	0.8755	0.0918	0	3.0000
1	25	2.2000	0.9574	0.1915	0	3.0000

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
Diff (1-2)		0.0967	0.8934	0.2017		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		2.2967	2.1144	2.4790	0.8755	0.7642	1.0251
1		2.2000	1.8048	2.5952	0.9574	0.7476	1.3319
Diff (1-2)	Pooled	0.0967	-0.3029	0.4963	0.8934	0.7910	1.0266
Diff (1-2)	Satterthwaite	0.0967	-0.3340	0.5274			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.48	0.6326
Satterthwaite	Unequal	35.79	0.46	0.6516

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	24	90	1.20	0.5354

Variable: b_Ultra_speed_Inter

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	1.2857	1.0571	0.1108	0	3.0000
1	25	1.2400	0.9695	0.1939	0	3.0000
Diff (1-2)		0.0457	1.0393	0.2347		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.2857	1.0656	1.5059	1.0571	0.9227	1.2377
1		1.2400	0.8398	1.6402	0.9695	0.7570	1.3488
Diff (1-2)	Pooled	0.0457	-0.4192	0.5106	1.0393	0.9201	1.1942
Diff (1-2)	Satterthwaite	0.0457	-0.4053	0.4967			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.19	0.8459
Satterthwaite	Unequal	41.068	0.20	0.8388

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	90	24	1.19	0.6472

Variable: c_New_revenues

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	1.6703	1.0006	0.1049	0	3.0000
1	25	2.0000	0.8165	0.1633	1.0000	3.0000
Diff (1-2)		-0.3297	0.9648	0.2179		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.6703	1.4619	1.8787	1.0006	0.8734	1.1716
1		2.0000	1.6630	2.3370	0.8165	0.6375	1.1359
Diff (1-2)	Pooled	-0.3297	-0.7612	0.1019	0.9648	0.8541	1.1086
Diff (1-2)	Satterthwaite	-0.3297	-0.7204	0.0610			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-1.51	0.1330
Satterthwaite	Unequal	45.81	-1.70	0.0962

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	90	24	1.50	0.2573

Variable: d_Smart_home_sol

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	0.7473	0.9380	0.0983	0	3.0000
1	25	0.5600	0.9609	0.1922	0	3.0000
Diff (1-2)		0.1873	0.9429	0.2129		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.7473	0.5519	0.9426	0.9380	0.8187	1.0983
1		0.5600	0.1634	0.9566	0.9609	0.7503	1.3368
Diff (1-2)	Pooled	0.1873	-0.2345	0.6090	0.9429	0.8348	1.0834
Diff (1-2)	Satterthwaite	0.1873	-0.2499	0.6245			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.88	0.3810
Satterthwaite	Unequal	37.525	0.87	0.3912

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	24	90	1.05	0.8327

Variable: a_Invest_net

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	1.8901	1.1780	0.1235	0	3.0000
1	25	1.8800	1.2014	0.2403	0	3.0000
Diff (1-2)		0.0101	1.1830	0.2671		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.8901	1.6448	2.1354	1.1780	1.0282	1.3794
1		1.8800	1.3841	2.3759	1.2014	0.9381	1.6713
Diff (1-2)	Pooled	0.0101	-0.5191	0.5393	1.1830	1.0474	1.3593
Diff (1-2)	Satterthwaite	0.0101	-0.5370	0.5572			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.04	0.9699
Satterthwaite	Unequal	37.653	0.04	0.9703

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	24	90	1.04	0.8544

Variable: b_Use_billing_rel

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	1.1319	1.0874	0.1140	0	3.0000
1	25	0.7600	1.0116	0.2023	0	3.0000
Diff (1-2)		0.3719	1.0719	0.2420		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.1319	0.9054	1.3583	1.0874	0.9491	1.2732
1		0.7600	0.3424	1.1776	1.0116	0.7899	1.4073
Diff (1-2)	Pooled	0.3719	-0.1076	0.8513	1.0719	0.9490	1.2316
Diff (1-2)	Satterthwaite	0.3719	-0.0973	0.8410			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	1.54	0.1272
Satterthwaite	Unequal	40.565	1.60	0.1171

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	90	24	1.16	0.7089

Variable: c_Gen_rev_Wholes

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	1.2308	0.9077	0.0952	0	3.0000
1	25	1.3200	0.9883	0.1977	0	3.0000
Diff (1-2)		-0.0892	0.9252	0.2089		

Variable: c_Gen_rev_Wholes

Operator	Method	Mean	95% CL Mean	Std Dev	95% CL Std Dev

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.2308	1.0417	1.4198	0.9077	0.7923	1.0628
1		1.3200	0.9121	1.7279	0.9883	0.7717	1.3748
Diff (1-2)	Pooled	-0.0892	-0.5031	0.3247	0.9252	0.8192	1.0632
Diff (1-2)	Satterthwaite	-0.0892	-0.5342	0.3557			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-0.43	0.6701
Satterthwaite	Unequal	35.9	-0.41	0.6866

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	24	90	1.19	0.5539

Variable: d_Converge_net_serv

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	1.7473	1.1115	0.1165	0	3.0000
1	25	2.0400	0.8406	0.1681	0	3.0000
Diff (1-2)		-0.2927	1.0602	0.2394		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.7473	1.5158	1.9787	1.1115	0.9701	1.3014
1		2.0400	1.6930	2.3870	0.8406	0.6564	1.1695
Diff (1-2)	Pooled	-0.2927	-0.7670	0.1815	1.0602	0.9387	1.2183
Diff (1-2)	Satterthwaite	-0.2927	-0.7037	0.1182			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-1.22	0.2239
Satterthwaite	Unequal	49.542	-1.43	0.1587

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	90	24	1.75	0.1202

The TTEST Procedure

Variable: a_Access_Net

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	2.0220	1.0952	0.1148	0	3.0000
1	25	1.8800	1.1299	0.2260	0	3.0000
Diff (1-2)		0.1420	1.1026	0.2490		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		2.0220	1.7939	2.2501	1.0952	0.9559	1.2824
1		1.8800	1.4136	2.3464	1.1299	0.8823	1.5719
Diff (1-2)	Pooled	0.1420	-0.3512	0.6352	1.1026	0.9762	1.2670
Diff (1-2)	Satterthwaite	0.1420	-0.3715	0.6554			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.57	0.5696
Satterthwaite	Unequal	37.326	0.56	0.5787

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	24	90	1.06	0.7988

Variable: b_Core_Net

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	1.3626	1.0057	0.1054	0	3.0000
1	25	1.4400	1.1576	0.2315	0	3.0000
Diff (1-2)		-0.0774	1.0395	0.2347		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.3626	1.1532	1.5721	1.0057	0.8778	1.1776
1		1.4400	0.9622	1.9178	1.1576	0.9039	1.6104

```
Diff (1-2)    Pooled            -0.0774     -0.5424   0.3876      1.0395      0.9203   1.1945
Diff (1-2)    Satterthwaite     -0.0774     -0.5940   0.4393

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.33      0.7423
                 Satterthwaite    Unequal      34.589      -0.30      0.7629

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        24        90       1.32    0.3437
```

```
                               Variable:  c_Service_Apps

        Operator        N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              91      1.8242      1.0176      0.1067           0      3.0000
        1              25      1.8800      1.0132      0.2026           0      3.0000
        Diff (1-2)            -0.0558      1.0166      0.2296

Operator      Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.8242      1.6123   2.0361      1.0176      0.8881   1.1914
1                                1.8800      1.4618   2.2982      1.0132      0.7912   1.4096
Diff (1-2)    Pooled            -0.0558     -0.5106   0.3989      1.0166      0.9001   1.1682
Diff (1-2)    Satterthwaite     -0.0558     -0.5193   0.4076

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.24      0.8083
                 Satterthwaite    Unequal      38.356      -0.24      0.8087

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        90        24       1.01    1.0000
```

```
                                Variable:  d_QoS_monitor

        Operator        N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              91      0.7912      0.9489      0.0995           0      3.0000
        1              25      0.8000      0.8660      0.1732           0      3.0000
        Diff (1-2)           -0.00879      0.9320      0.2105

Operator      Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                0.7912      0.5936   0.9888      0.9489      0.8282   1.1110
1                                0.8000      0.4425   1.1575      0.8660      0.6762   1.2048
Diff (1-2)    Pooled           -0.00879     -0.4257   0.4081      0.9320      0.8252   1.0710
Diff (1-2)    Satterthwaite    -0.00879     -0.4121   0.3945

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -0.04      0.9668
                 Satterthwaite    Unequal      41.245      -0.04      0.9651

                                   Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        90        24       1.20    0.6265
```

```
                             Variable:  a_Strategic_collab

        Operator        N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              91      1.5604      1.0242      0.1074           0      3.0000
        1              25      1.5200      0.9183      0.1837           0      3.0000
        Diff (1-2)             0.0404      1.0029      0.2265

Operator      Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                                1.5604      1.3471   1.7737      1.0242      0.8940   1.1993
1                                1.5200      1.1409   1.8991      0.9183      0.7171   1.2775
Diff (1-2)    Pooled             0.0404     -0.4082   0.4891      1.0029      0.8879   1.1524
Diff (1-2)    Satterthwaite      0.0404     -0.3889   0.4698

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.18      0.8586
```

```
                 Satterthwaite    Unequal      41.902       0.19      0.8502

                                  Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        90        24       1.24    0.5543
```

```
                                Variable:  b_Effective_regul

         Operator        N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              91      0.8462      1.0638      0.1115           0      3.0000
         1              25      0.6400      0.9950      0.1990           0      3.0000
         Diff (1-2)             0.2062      1.0497      0.2370

 Operator      Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                                0.8462      0.6246   1.0677      1.0638      0.9285   1.2456
 1                                0.6400      0.2293   1.0507      0.9950      0.7769   1.3842
 Diff (1-2)    Pooled             0.2062     -0.2634   0.6757      1.0497      0.9293   1.2061
 Diff (1-2)    Satterthwaite      0.2062     -0.2547   0.6671

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.87      0.3863
                 Satterthwaite    Unequal      40.378       0.90      0.3715

                                  Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        90        24       1.14    0.7330
```

```
                                 Variable:  c_Cont_invest

         Operator        N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              91      2.1209      0.9290      0.0974           0      3.0000
         1              25      1.9200      1.0376      0.2075           0      3.0000
         Diff (1-2)             0.2009      0.9529      0.2152

 Operator      Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                                2.1209      1.9274   2.3143      0.9290      0.8108   1.0877
 1                                1.9200      1.4917   2.3483      1.0376      0.8102   1.4435
 Diff (1-2)    Pooled             0.2009     -0.2254   0.6271      0.9529      0.8436   1.0949
 Diff (1-2)    Satterthwaite      0.2009     -0.2644   0.6661

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.93      0.3525
                 Satterthwaite    Unequal      35.278       0.88      0.3868

                                  Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        24        90       1.25    0.4506
```

```
                                Variable:  d_Bundling_serv

         Operator        N        Mean     Std Dev     Std Err     Minimum     Maximum

         0              91      1.4725      1.0887      0.1141           0      3.0000
         1              25      1.9200      1.0770      0.2154           0      3.0000
         Diff (1-2)            -0.4475      1.0863      0.2453

 Operator      Method               Mean       95% CL Mean        Std Dev      95% CL Std Dev

 0                                1.4725      1.2458   1.6993      1.0887      0.9503   1.2748
 1                                1.9200      1.4754   2.3646      1.0770      0.8410   1.4983
 Diff (1-2)    Pooled            -0.4475     -0.9334   0.0384      1.0863      0.9617   1.2482
 Diff (1-2)    Satterthwaite     -0.4475     -0.9407   0.0458

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -1.82      0.0707
                 Satterthwaite    Unequal      38.556      -1.84      0.0741

                                  Equality of Variances
```

```
                        Method      Num DF    Den DF    F Value    Pr > F

                        Folded F        90        24       1.02    0.9975
```

```
                                   Variable:  a_Sys_vend_integ

        Operator        N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              91      1.4615      1.1672      0.1224           0      3.0000
        1              25      1.3600      0.9950      0.1990           0      3.0000
        Diff (1-2)             0.1015      1.1331      0.2559

                                   Variable:  a_Sys_vend_integ

Operator      Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.4615      1.2185   1.7046      1.1672      1.0188   1.3667
1                               1.3600      0.9493   1.7707      0.9950      0.7769   1.3842
Diff (1-2)    Pooled            0.1015     -0.4053   0.6084      1.1331      1.0032   1.3020
Diff (1-2)    Satterthwaite     0.1015     -0.3693   0.5724

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.40      0.6922
                 Satterthwaite    Unequal      43.904       0.43      0.6659

                                      Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        90        24       1.38    0.3766
```

```
                                  Variable:  b_Oth_oper_wholesale

        Operator        N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              91      1.0879      0.9849      0.1032           0      3.0000
        1              25      1.0000      1.1547      0.2309           0      3.0000
        Diff (1-2)             0.0879      1.0230      0.2310

Operator      Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.0879      0.8828   1.2930      0.9849      0.8596   1.1532
1                               1.0000      0.5234   1.4766      1.1547      0.9016   1.6064
Diff (1-2)    Pooled            0.0879     -0.3697   0.5455      1.0230      0.9057   1.1754
Diff (1-2)    Satterthwaite     0.0879     -0.4261   0.6019

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114       0.38      0.7042
                 Satterthwaite    Unequal      34.188       0.35      0.7303

                                      Equality of Variances

                      Method      Num DF    Den DF    F Value    Pr > F

                      Folded F        24        90       1.37    0.2863
```

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                                       The TTEST Procedure

                                     Variable:  c_Cont_provid

        Operator        N        Mean     Std Dev     Std Err     Minimum     Maximum

        0              91      1.9121      0.9849      0.1032           0      3.0000
        1              25      2.3200      0.8021      0.1604           0      3.0000
        Diff (1-2)            -0.4079      0.9493      0.2144

Operator      Method              Mean       95% CL Mean        Std Dev      95% CL Std Dev

0                               1.9121      1.7070   2.1172      0.9849      0.8596   1.1532
1                               2.3200      1.9889   2.6511      0.8021      0.6263   1.1158
Diff (1-2)    Pooled           -0.4079     -0.8326   0.0167      0.9493      0.8405   1.0908
Diff (1-2)    Satterthwaite    -0.4079     -0.7919  -0.0239

                 Method           Variances        DF    t Value    Pr > |t|

                 Pooled           Equal           114      -1.90      0.0596
                 Satterthwaite    Unequal        45.9      -2.14      0.0379

                                      Equality of Variances
```

Method	Num DF	Den DF	F Value	Pr > F
Folded F	90	24	1.51	0.2527

Variable: d_Net_co_Skype

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	1.5385	1.1861	0.1243	0	3.0000
1	25	1.3200	1.1075	0.2215	0	3.0000
Diff (1-2)		0.2185	1.1700	0.2642		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.5385	1.2914	1.7855	1.1861	1.0353	1.3888
1		1.3200	0.8628	1.7772	1.1075	0.8648	1.5408
Diff (1-2)	Pooled	0.2185	-0.3049	0.7418	1.1700	1.0358	1.3444
Diff (1-2)	Satterthwaite	0.2185	-0.2948	0.7317			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.83	0.4100
Satterthwaite	Unequal	40.436	0.86	0.3949

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	90	24	1.15	0.7255

Variable: a_Int_resist

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	1.6703	1.0960	0.1149	0	3.0000
1	25	1.7600	0.8307	0.1661	0	3.0000
Diff (1-2)		-0.0897	1.0458	0.2361		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.6703	1.4421	1.8986	1.0960	0.9566	1.2833
1		1.7600	1.4171	2.1029	0.8307	0.6486	1.1556
Diff (1-2)	Pooled	-0.0897	-0.5575	0.3781	1.0458	0.9258	1.2016
Diff (1-2)	Satterthwaite	-0.0897	-0.4955	0.3162			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-0.38	0.7048
Satterthwaite	Unequal	49.432	-0.44	0.6590

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	90	24	1.74	0.1229

Variable: b_Out_date_bus

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	2.2527	0.9018	0.0945	0	3.0000
1	25	2.5200	0.8226	0.1645	0	3.0000
Diff (1-2)		-0.2673	0.8857	0.2000		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		2.2527	2.0649	2.4405	0.9018	0.7871	1.0559
1		2.5200	2.1804	2.8596	0.8226	0.6423	1.1444
Diff (1-2)	Pooled	-0.2673	-0.6634	0.1289	0.8857	0.7841	1.0177
Diff (1-2)	Satterthwaite	-0.2673	-0.6504	0.1159			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-1.34	0.1841
Satterthwaite	Unequal	41.264	-1.41	0.1665

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	90	24	1.20	0.6243

Variable: c_Erod_profit

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	1.3516	0.9818	0.1029	0	3.0000
1	25	0.8400	0.8981	0.1796	0	3.0000
Diff (1-2)		0.5116	0.9648	0.2179		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.3516	1.1472	1.5561	0.9818	0.8569	1.1495
1		0.8400	0.4693	1.2107	0.8981	0.7013	1.2495
Diff (1-2)	Pooled	0.5116	0.0801	0.9432	0.9648	0.8541	1.1086
Diff (1-2)	Satterthwaite	0.5116	0.0936	0.9297			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	2.35	0.0206
Satterthwaite	Unequal	41.16	2.47	0.0177

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	90	24	1.19	0.6364

Variable: d_Much_reg

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	0.7253	0.9197	0.0964	0	3.0000
1	25	0.8800	1.0132	0.2026	0	3.0000
Diff (1-2)		-0.1547	0.9402	0.2123		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.7253	0.5337	0.9168	0.9197	0.8028	1.0769
1		0.8800	0.4618	1.2982	1.0132	0.7912	1.4096
Diff (1-2)	Pooled	-0.1547	-0.5753	0.2658	0.9402	0.8324	1.0803
Diff (1-2)	Satterthwaite	-0.1547	-0.6100	0.3006			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-0.73	0.4676
Satterthwaite	Unequal	35.608	-0.69	0.4950

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	24	90	1.21	0.5049

Variable: a_Mod_scalable

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	2.1868	0.8552	0.0897	0	3.0000
1	25	2.1600	0.8505	0.1701	1.0000	3.0000
Diff (1-2)		0.0268	0.8542	0.1929		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		2.1868	2.0087	2.3649	0.8552	0.7465	1.0014
1		2.1600	1.8089	2.5111	0.8505	0.6641	1.1832
Diff (1-2)	Pooled	0.0268	-0.3553	0.4089	0.8542	0.7563	0.9815
Diff (1-2)	Satterthwaite	0.0268	-0.3623	0.4159			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.14	0.8897
Satterthwaite	Unequal	38.395	0.14	0.8898

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	90	24	1.01	1.0000

Variable: b_One_stop_shop

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	1.8462	1.0427	0.1093	0	3.0000

1	25	1.7600	1.0116	0.2023	0	3.0000
Diff (1-2)		0.0862	1.0362	0.2340		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.8462	1.6290	2.0633	1.0427	0.9101	1.2209
1		1.7600	1.3424	2.1776	1.0116	0.7899	1.4073
Diff (1-2)	Pooled	0.0862	-0.3774	0.5497	1.0362	0.9174	1.1907
Diff (1-2)	Satterthwaite	0.0862	-0.3789	0.5512			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.37	0.7134
Satterthwaite	Unequal	39.164	0.37	0.7099

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	90	24	1.06	0.9035

Variable: c_Lean_org

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	1.5604	0.9215	0.0966	0	3.0000
1	25	1.7200	0.9363	0.1873	0	3.0000
Diff (1-2)		-0.1596	0.9246	0.2088		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		1.5604	1.3685	1.7523	0.9215	0.8043	1.0789
1		1.7200	1.3335	2.1065	0.9363	0.7311	1.3025
Diff (1-2)	Pooled	-0.1596	-0.5732	0.2540	0.9246	0.8186	1.0624
Diff (1-2)	Satterthwaite	-0.1596	-0.5862	0.2671			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	-0.76	0.4463
Satterthwaite	Unequal	37.758	-0.76	0.4536

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	24	90	1.03	0.8720

Variable: d_Max_cont_mono

Operator	N	Mean	Std Dev	Std Err	Minimum	Maximum
0	91	0.4066	0.7598	0.0796	0	3.0000
1	25	0.3600	0.8103	0.1621	0	3.0000
Diff (1-2)		0.0466	0.7707	0.1740		

Operator	Method	Mean	95% CL Mean		Std Dev	95% CL Std Dev	
0		0.4066	0.2484	0.5648	0.7598	0.6632	0.8896
1		0.3600	0.0255	0.6945	0.8103	0.6327	1.1273
Diff (1-2)	Pooled	0.0466	-0.2982	0.3914	0.7707	0.6823	0.8856
Diff (1-2)	Satterthwaite	0.0466	-0.3195	0.4127			

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	114	0.27	0.7894
Satterthwaite	Unequal	36.426	0.26	0.7978

Equality of Variances

Method	Num DF	Den DF	F Value	Pr > F
Folded F	24	90	1.14	0.6439

Biography

Muneer Zuhdi has joined the Ph.D program at the University of Aveiro in 2009. He got his Master of Business Administration (MBA) from the University of Texas in 2003 with focus on Technology Management, and got his Master of Science in Electrical Engineering from the University of Texas in 1996 with focus on Telecommunications Engineering. Before that, he received his bachelor degree from Damascus University in 1993 with focus on Electronics Engineering. All the degress were granted with honors.

Muneer has more than 17 years professional work experience that started in teaching and consulting before entering the telecom industry in 1996 working for Reltec, AFC, Marconi, and Tellabs where he held technical and management positions. He joined Etisalat, a service provider, in 2008 where he is now a Senior Director of Technology Strategy. In his current role, he oversees the Technology Strategy for Fixed and Mobile Networks.

Muneer has more than 15 American and international patents and he is very involved in the telecom industry through conference presentations, invited talks, standardization, and publications.